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THE
INTERNATIONAL DENTAL JOURNAL

A MONTHLY PERIODICAL

DEVOTED TO

DENTAL AND ORAL SCIENCE

EDITED BY

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AND

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VOL. XXI.

PHILADELPHIA
INTERNATIONAL DENTAL PUBLICATION COMPANY

1900

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THE International Dental Journal.

VOL. XXI.

JANUARY, 1900.

No. 1.

Original Communications.¹

APOLLONIA, THE "PATRON SAINT OF DENTISTRY."²

BY C. N. PEIRCE, D.D.S., PHILADELPHIA.

I HAVE, by request, Mr. President, a very pleasurable function to perform. A lady member of this society, Dr. Mary H. Stilwell, desires to present to this organization the photograph of a character as unique and interesting as it is ancient, and she has kindly requested me to be her spokesman.

Some of you may be somewhat familiar with the subject to be presented, but doubtless to most of you the history and character of Saint Apollonia, the "Patron Saint of Dentistry," will be novel. That dentistry, of all the branches or specialties of medicine, has a patron saint I assume is known to very few in the dental profession. A brief recital of the history so far as obtainable of this saint has an historical as well as a professional interest. She was the daughter of a heathen magistrate in the city of Alexandria. Her mother, although not a Christian, was inclined to look with sympathy on the believers in that faith, and, being childless, she asked if the Virgin could grant her prayer for a child, on being told of her great power.

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the Academy of Stomatology, Philadelphia, December 28, 1899.

She gave the pilgrims food and money, so, full of faith, she invoked Mary's intercession, after which the prayer was answered by the birth of Apollonia. To the child the mother often spoke of the wonderful power there was in the prayers of these people. It is not surprising, therefore, that Apollonia as she grew up felt more and more deeply that this alone was the one religion that could satisfy and ennoble her life. Longing to obtain the grace of baptism, she made her way to Saint Leonine, a disciple of Saint Anthony of Egypt, and as he baptized her he bade her go to Alexandria and preach the faith. So she went forth, and though she was only a woman, young and frail, yet so eloquent were her words, so fervent her zeal, that she made many converts. About this time a tumult had been stirred up in the city against the Christians, and the mass of the people were enraged at her preaching and came with bitter complaints to her father, who gave her up to be judged by the governor. They brought her before the idol temple and bade her worship the graven image. It is reported that she made a sign of the cross, and there came forth from the statue an evil spirit shrieking, "Apollonia has driven me hence." This was more than could be borne, the people thirsted for vengeance, so they tried by torture to overcome her constancy. She was bound, and one by one her teeth were drawn out, but still she did not flinch or fear, and on her refusal to accede to the demands of her persecutors and renounce her faith, she was brutally clubbed about the head and face and subsequently suffered death by fire.

For a period of nearly fifteen hundred years her intercession has been sought for relief from all pain incident to dental diseases, and her relics have been and are regarded as possessing great efficacy in the cure of the same.

The canonization of Saint Apollonia took place about the year 300 A.D.

On the 9th of February of each year she is commemorated. The so-called relics or remains of her head and jaws which were preserved from the fire into which she was thrown are preserved in various churches in the East and West. Church Saint Apollonia, at Rome, has a portion; in St. Maria Transtiberina her head rests; in St. Lawrence, outside the walls, her arms; in St. Basil's, part of her jaws; while in churches at Naples, Antwerp, Brussels, and Cologne, portions of the bones or teeth are cherished. In Quebec, Canada, we find also portions of a bone or tooth resting in some of the churches and viewed with veneration.

Furini has painted her in a picture now at Florence, Luini in

Monastery Maggiore Milan, and in the Milan Gallery there is an altar-piece by Francesco Granaee, on one wing of which is an almost life-size figure of her. Underneath the picture at Florence is the story of her life, from the moment of the angelic call until her death.

Procaccino has also painted her martyrdom, and she is also to be found in the works of that somewhat sentimental painter, Carlo Dolce.

Chapels and altars in her honor are found in many of the Eastern and Western churches. Her distinctive emblems are the pincers and tooth; the latter, in some of the paintings, is hung by a gold chain around her neck as an ornament.

Such records as we have been able to collect of Saint Apollonia give evidence of her dauntless courage, her perfect obedience to what she believed was the voice of God, and her fervent missionary spirit. Her story adds one more link to the long chain of heroes and heroines whose lives strike like sunlight across many a dark page of history.

The above short sketch has been obtained from "Gould's Lives of Saints," "Cassell's Dictionary of Religion," and a Letter of Dionysius to Fabius, Bishop of Antioch, published in the history of the Christian Church, by Eusebius, during the persecutions of the Christians at Alexandria, in the year 249.

THE STATUS OF OUR PROFESSION AND ITS EDUCATIONAL METHODS IN ENGLAND, AS SHOWN IN RECENT PUBLICATIONS.¹

BY WILLIAM H. TRUEMAN, D.D.S., PHILADELPHIA.

IN fulfilling an obligation assumed when accepting honorary membership in your body, and an assignment to your Committee on Dental Literature, I have elected to present "The Status of Our Profession and its Educational Methods in England, as shown by Recent Publications." The matter presented has been gathered mainly from the English dental journals for 1898, in the effort to form an *exposé* of the general trend of thought there expressed upon matters of common interest affecting the status of our profession, its

¹ Read before The New York Institute of Stomatology, October 2, 1900.

educational interests, its scientific standing, and its general tone. It has seemed to me that this would be in line with your committee's work, and probably would not, as these journals are not widely read in this country, trench upon work already done or in contemplation, and that it might be of interest to have in concrete a general idea, even limited as a paper like this must necessarily be, of what our brethren on the other side have been doing in matters upon which we are all so keenly alive.

We will first turn to the *Journal of the British Dental Association*, for to this journal, published by the Association, and its official organ, by virtue of this, in all matters concerning strictly professional affairs, must be accorded first place among English dental periodicals. In addition and apart from this, however, it has always been well edited, conservative yet progressive, thoroughly professional in tone, and well merits this position as an official exponent of English dental thought. It has, I am sorry to say, no counterpart in the United States. That this is so seems an oversight on the part of our national associations, past and present. For a few years the American Association of Dental Surgeons published the first dental journal of which we have any record. It is much to be regretted that they ever allowed it to pass out of their hands. It is more than an oversight, it is a blunder, that its successors have so far failed to remedy this mistake by providing for themselves an official organ and for the profession a high-toned, independent dental journal, as the British Dental Association has done, instead of year after year making merchandise of their proceedings. For a number of years the *Journal of the British Dental Association* was published at a financial loss. Since 1895 it has proved an increasing source of revenue. Far more important than the mere money consideration, however, it has been a means of keeping the Association in touch with its constituents, and has provided for the dental profession in Great Britain a journal entirely free from commercial interests and wholly within its control.

An editorial in the January number, entitled "The Educational Business of the General Medical Council," is instructive. It complains very mildly of the Medical Council's tardy action upon desired changes in the dental curriculum, and explains that the method adopted by the council necessarily entailed a certain amount of delay. First, a visiting committee was appointed to inspect and report upon the work of the various examining bodies. These reports, after being formally received, were submitted to the examining bodies

concerned for any criticism or suggestions that they might have to make. When these are returned, they are referred for discussion to the next session of the General Council. This is the usual course with such matters, and it may be that several sessions pass before final action is taken. This, as the Council meets but twice a year, takes considerable time, but insures thorough and careful work. Any supposed dereliction of duty in the schools or examining bodies is not there, as it is with us, at once anonymously ventilated in the dental journals or societies by irresponsible parties, in such a manner that, while a slur is cast upon all alike, neither the schools nor the examining boards implicated, nor those to whom the information may be of value, are at all benefited or enlightened. The conservative, yet effective, procedure of the British General Medical Council is far more dignified: fair, open, and just to all concerned. When the matter is finally reached, after at least six months' careful thought, the conclusions are far more satisfactory to the teachers, more helpful to the taught, and more useful to those who are desirous that their pupils shall receive the best possible professional training.

They have on the other side the same knotty problems that confront us here. There is a very general desire to elevate and make more of the dental profession, but all are not agreed as to the ways and means. The educational problem has been for some years the subject of anxious thought. There is a marked diversity of opinion regarding the changes desirable and the changes possible,—the standard the *powers that be* are willing to sanction, that which leaders of the profession demand, and that which the schools and the examining bodies deem expedient for their respective bailiwicks. There has not been, and for some time cannot be, that uniformity which should exist, in view of the fact that a license to practise, or rather to assume the title of dentist, granted by either one of the several licensing bodies is equally good in any part of the realm. On these points the medical and the dental professions are equally agitated. The dental profession is not in Great Britain free and independent and in a position to control its own affairs, as it is with us. They are legally so blended—the two professions—that the dental is the ward of the medical, and until a little more than a year ago had no voice in the council that regulates even to the minutest detail its legal and educational affairs, except through the courtesy of its medical friends. This will explain why the remarks that follow are taken from addresses by medical men, writing upon medical

topics. They were, while speaking in their own interests, equally advancing the interests of their voiceless and dependent ward. In this controversy one party aggressively demands a "single portal" for each profession,—that is, that for medicine and for dentistry the course of instruction in all the schools teaching these sciences and the standard of all the examining bodies granting medical and dental qualifications shall be exactly the same; just as though there was for the medical profession but one school and but one examining board, and a corresponding school and examining board for the dental profession. To accomplish this is not simply a question of levelling up or of levelling down. It would require some schools of excellent repute to entirely recast their course of instruction, and would thereby introduce much confusion, not only in the schools themselves, but also in their relation to other schools and to other professions, without the slightest advantage or any real educational advance. It would also require the examining bodies from which their students receive their degrees to radically change their methods without any material upward or downward change in their standards. These naturally object to any immediate radical change, but suggest that it may be brought about in course of time.

An address by Mr. Victor Horsley, F.R.C.S. (Eng.), F.R.S., entitled, "The Medical Acts of Parliament: As they are and as they ought to be,"¹ is an excellent presentation of the subject from the stand-point of the aggressive party. Mr. Horsley is a member of the Medical Council who has always shown a friendly and active interest in the dental profession. While his remarks in this address are upon the Medical Act, as I have before stated, that and the Dental Act are so closely related that his address would be just as appropriate if, wherever it occurs, the word dental were inserted in place of medical. He first treats at some length of a peculiarity of both the Medical and Dental Acts. Neither prohibits or punishes, except by implication, practice by unqualified persons. In this they have been a disappointment. It was presumed that a law which required that all who assumed to practise either art should, after complying with certain legal requirements, be registered as qualified practitioners would do more than protect the title designating the calling of those who obeyed it, and do more than forbid the use of the title and due process of law in collecting fees by those who disregarded it. It was presumed, indeed, that it was especially aimed at the *practice* of

¹ Journal of the British Dental Association, January, 1898, page 45.

either profession by those not properly qualified. Practically, so far as it has been expounded by judicial decisions, it permits any ignorant to practise, provided he be careful not to use the title. In the case of *British Dental Association vs. Herbert Manning*, heard at Lough, Lincolnshire, September 3, 1898,¹ Mr. R. W. Turner, in stating for the prosecution the law involved in the case, said, "A person shall not be allowed to take the title or use the title of dentist, either alone or in combination with any other word or words, or of dental practitioner, or any name, title, or description implying that he is registered under this Act, or that he is a person specially qualified to practise dentistry, unless he is registered under this Act. An amendment declares that the words 'title or description,' where used in the Dental Act, include any addition to a name or designation or description, whether expressed in words or by letters, or partly in one way and partly in another." In this case, as in others, the conviction secured was for using the title, not for engaging in practice. Now, Mr. Horsley contends that this is all wrong; that a law which requires a man to spend years in acquiring knowledge and skill to become under it a qualified practitioner should protect him in the practice of his art from the competition of those who have not so done. He thinks that the law as it stands will bear this construction. He admits, however, that the General Medical Council and magistrates do not take that view of it, and that the legal advisers of the Medical Defence Union have suggested that it would be expedient to get an amendment to the Act, so as to make it clear that a person who was not registered was not entitled to practise, and that if he did so he would be punished. He argues at some length in support of his contention, and chides the Medical Council for being guided in these matters by their legal advisers. He urges that they should put their own construction upon the law it is their duty to enforce, and, selecting a case where this issue is involved, prosecute it to a finality. Calling attention to the so-called "overcrowding" in the profession, he argues that that could in part be prevented by raising the standard of the preliminary examinations, and contends that these—indeed, all the examinations, from preliminary to final—should be absolutely uniform throughout the United Kingdom, and conducted by the General Medical Council. He suggests, further, that they should confer upon the successful

¹ *Journal of the British Dental Association*, vol. xix., October, 1898, page 179.

candidate the state qualification to be registered, carrying with it the title of "doctor." This is known as the one-portal system, and is opposed in the Medical Council by the representatives of the corporations or guilds, for reasons financial and otherwise.

In an address upon "Legislation as a Remedy for Medical Grievances," Mr. R. Brudenell Carter, F.R.C.S. (page 109, February number of the same journal), gives the other side of these controverted questions. It is, indeed, an answer to Mr. Horsley's remarks. Mr. Carter tells us that after a long experience as a general medical practitioner he, as surgeon to the eye department of St. George's Hospital, and later as a member of the editorial staff of two medical journals, has been brought into intimate and friendly relations with general practitioners in all parts of the country. Since when, in the early fifties, medical legislation was first broached, he has had ample opportunity to become well acquainted with all the varied phases of medico-political questions. Since 1887 he has been a member of the General Medical Council. An address coming from a man with so wide an experience, so practical in his ideas, so excellent and pertinent throughout, merits a careful and thoughtful reading. I have room here for only a few of the more prominent suggestions, and have endeavored to select those which are of more than local interest. He says, "The members of every calling or profession find something in their relations with the public or with their more especial *clientèle* which might be amended, and it will also be conceded that, as the wearer of the shoe knows best where it pinches, so the members of every profession know their own grievances, and think more of the evils these grievances produce than they would of the grievances of other people.

"In these circumstances I am disposed to look on the consciousness of grievances on the part of the members of any profession somewhat as a sign of healthy vitality, and I should feel doubt as to the future of a society in which grievances and a determination to remedy them did not exist. But the present grievances of the medical profession, in my humble judgment, much transcends what we may describe as normal, and are becoming year by year more oppressive.

"If they do not arise from, they are least intensified by, the fact that members of the profession of late years have been increasing in numbers with a rapidity previously unknown, whilst at the same time the demand for their services has in many directions been diminishing. The general result of increased knowledge has been

greatly to diminish the amount of illness occurring, and in surgical cases, particularly, to curtail the duration of illness.

"Just to take an example: A woman with an ovarian tumor would have been likely to sink into the grave after some four or five years of lingering illness, during which she would have been constantly dependent for the relief of suffering on the general medical practitioner. At the present time she undergoes an operation, and in a month is restored to health.¹ I have seen it stated that there are fourteen thousand general practitioners in England and Wales. If this be true, there must be more than eight thousand physicians and surgeons, in a strict sense, specialists. Can we wonder that men of all classes find it difficult to keep the wolf from the door, or that a few stoop to practices which they can only excuse by saying 'my poverty, but not my will, consents'? It must not be supposed that I have the slightest sympathy with Mr. Horsley's desire to check entrance into the profession. This would be a mere trades-union device; medical students are in large proportion the sons of medical practitioners, and while due provision should be made for raising the standards in a degree commensurate with the progress of the science, parents are entitled to bring their sons into the profession on about the same terms which were enforced upon themselves."

He refers to the unsuccessful endeavors of energetic medical reformers to have inserted into the medical act a clause punishing unqualified practitioners. The government would not accept any clause proposed to them, and the chief effect of the attempt was to bring into prominence the great difficulty of putting together any form of words which would fulfil the intended purpose, and which would not admit of being wrested into constructions improperly repressive of individual liberty. He ventured the opinion that the Medical Council could not punish for advertising, except the advertisement was so worded as to be of itself "infamous;" and questioned if they

¹ The same advance—for it is an advance—may be noted in our profession, producing the same result. Witness the increased productiveness of a pair of hands and one head as we have passed from carved plates to enameled plates, from hand-carved black teeth to the ready-made porcelain teeth of the dental depots produced commercially by the million; from the intricate and time-consuming fabrication of metal and of porcelain dentures to those on cast or plastic bases. And, again, from contoured gold fillings, laboriously built up to the plastic, to crowns and bridges, and to inlays. And, again, the lessened need of the dentist's care, the result of increased attention to preventative measures, and an increased appreciation of early and regular dental attention.

had the right to remove a name from the register for purely ethical offences. The law is primarily for the protection of the public, to enforce honesty and fair dealing, and has but slight regard for those rules or regulations the members of a calling or profession may see fit to adopt for their own pleasure or profit. If the law advances the material or social interests of the profession, it is a mere incident; it was not enacted for that purpose; indeed, in strict equity, could not be; nor can it justly be twisted or strained to effect that object. The profession must look to itself, and itself provide the ways and means of its own uplifting. While these sentiments may not be welcome, they probably forecast the final outcome of efforts on both sides of the sea to elevate by legal enactments the professional standard. This controversy between Mr. Horsley and Mr. Carter is well worth a careful reading, bearing in mind that while they are speaking particularly of the medical profession, all that is said is quite as applicable to the dental profession. The medical and the dental enactments are practically one, and both professions look to the same body to protect and to enforce their rights.

The controversy between these two gentlemen suggests much more than either have stated. While the dental law has undoubtedly had the desired effect of causing a much larger number than without it would have so done to appreciate the importance of proper preparation before entering professional ranks, and has done much, very much, to advance professional interests in every way; while, indeed, educationally, for the practitioner, the student, and the schools, it has done all that could reasonably have been expected from it, commercially, thus far, it has proved a failure. As read, it seems to be all that could be desired. When tested in court it has proved very defective. It is so worded (it is now said purposely so; for so jealously does the law-making bodies guard and protect the individual's rights and commercial interests, that had it been more stringently worded it would never have been enacted) that it is not only difficult to secure convictions, but a conviction usually carries with it nothing more than a small fine and the expense of a new sign or door-plate. It does not necessarily stop the business of the unqualified practitioner. This law has another serious defect in that it seems to allow companies and associations organized to carry on a dental business privileges and immunities denied to individuals. An earnest effort is now being made to correct this; but it is found to be a very difficult task to put together a form of words that will prove effective and yet be acceptable to the law-making powers.

The discussions upon this point, in the dental journals now in review, are well worth a careful reading.

In the July number, page 454, will be found a full report of the proceedings of the General Medical Council, the session beginning May 27, 1898, at which the Council recast the course of instruction and outlined the examinations recommended to the teaching and examining bodies for the qualification of L.D.S. A careful perusal of this will show how very different are the conditions encountered by a dental student in Great Britain and in the United States. While in Great Britain there are many dental and medical schools, they are simply teaching bodies. The examining and licensing bodies are separate and distinct. The dental student may obtain his education where he will, part at a medical school or hospital, and part at a dental school; part, if he so desires, in his preceptor's laboratory. It matters not, provided that the school is one approved by the Medical Council, and his preceptor is a qualified practitioner. He must, however, take his examinations from either the Royal College of Surgeons of England, the Royal College of Surgeons of Edinburgh, the Faculty of Physicians and Surgeons of Glasgow, or the Royal College of Surgeons in Ireland; these are the only recognized examining bodies. So very different is the system of dental education in the two countries that it is no easy task for any one to compare them. Carefully going over this discussion, I am strongly impressed that the graded systematic course of the American dental college, where a continuous line of instruction is directed to the one object, preparing the student to enter the dental profession, which aims to impart all that is needed to be fully equipped to meet every phase of his life-work, where all the instruction he receives has this direct trend, is preferable to one such as is here recommended, "of shreds and patches," part dental and part medical; a great deal of which has to the dentist no practical usefulness, and which, taken as a whole, is, *apparently*, so unsystematic and disconnected that the chances are many things of vital importance will be overlooked, while others of great value are purposely omitted. As it has been planned and accepted by those who are presumed to have at heart the best interests of the profession, those who know better than we do the facilities at hand and the conditions their students are required to meet on entering actual practice, we may justly assume that it is the best course possible under the circumstances for a student who desires to practise in Great Britain, while at the same time holding firmly that the American Dental

College is infinitely better for one who intends to make the United States his home. I most earnestly commend a careful reading of this discussion and those which have led up to it to those interested in the international phase of dental education. It is far too important to be reviewed as briefly as this paper demands.

In passing, permit me to digress for a moment to suggest that this discussion, taken in connection with others in the same body which have from time to time preceded it, the many complaints from dentists, the retorts they have called forth from members of the medical profession which we find expressed in the journals, more forcible as the years roll round, have impressed me strongly that the dental profession in the United States have reason to be very thankful to those who first organized its educational system for striking out as they did on a new and independent line. In refusing to accept the meagre facilities grudgingly offered by the then medical colleges, and boldly and bravely assuming the task of organizing a school that should within itself teach all that a dentist is required to know; when they invented the distinctive degree, D.D.S.; when they cut loose from the medical profession with all its time-honored methods and traditions and proclaimed to the world their purpose to provide for their calling the means by which it should, unaided and alone, make for itself a position and a name among the professions of the world, they assumed a tremendous task; they made of it a grand success. This has made the dental profession in the United States not a branch, not a specialty, not a part of the great medical profession, but a profession of and in itself, separate and distinct, self-contained and self-supporting. We have not been trammelled in our educational advances as have been our brethren on the other side. Our educational pioneers were far too sturdy and self-reliant to patiently knock, year after year, subserviently seeking admission at the ponderous doors of the medical profession. They preferred to build a house of their own. We have thereby escaped the humiliation of being considered unwelcome guests; of being hampered in our pursuit of knowledge, and in the exercise of our skill and talent, by the jealousies of an elder brother. True, we have trenched upon the domain of surgery and medicine, as the Medical Council fear well-educated dentists will. We have taught both of these elder brethren lessons in methods and modes of procedure. Our mechanical skill, closely specialized observation, and delicate, well-trained finger craft have made their impress in unravelling histological mysteries; tracing the course of pathological

changes; refining and modifying old and inventing new surgical appliances and processes. Graduates of American dental colleges have reversed the rule the General Medical Council would enforce if they could, in that they have been dentists first and surgeons after; and in the latter field, owing to their early training, have become recognized masters. Our educators are not controlled by commercially jealous masters having no sympathy with our profession, who enviously regard the golden ducats which a remote possibility may divert; who are not in touch with its marvellous progress, its possibilities, and its resources; but would cramp it within the narrow compass of "tooth-pulling and the like." Say what you will, decide it as you may, the American dental college has well earned its right to be. It has made a lasting impress on the world's onward and upward progress. That its graduates are so generally recognized as masters in their profession, and so many of them have risen to distinction, attest the thoroughness of its teaching and the completeness of its curriculum.

Considerable space is given to the proceedings of the Annual Meeting of the British Dental Association, at Bath, May 28-31, 1898, in the June number (page 343).¹ This is prefaced by an interesting illustrated account of this ancient Roman town, its hot springs, its baths, and its beautiful surroundings and historic associations. The Association has a membership of one thousand and nineteen, about one-fifth of those who are eligible, certainly a very creditable showing. The attendance is said to have been quite large, and the meeting, socially and educationally, satisfactory in every way. The finances of the Association are in excellent condition, it having, by the treasurer's report, some five thousand dollars on hand and invested. The Association takes a part in the financial burden of enforcing the dental laws, and this accumulated capital is a moral as well as a material help in carrying on this part of its work. In addition, separate and apart from its other work, the Association has taken care of its unfortunate members; indeed, with commendable broadness and liberality, it has now and again stepped over the line to extend a helping hand to those who have had no further claim than being followers of a common calling,—professional brothers in its widest sense. This is done by means of a "Benevolent Fund," maintained by yearly subscriptions, donations, etc., so well managed

¹ *Journal of the British Dental Association*, vol. xix., June, 1898, page 395.

and supported that its treasurer reported at this meeting an invested fund of over fifteen hundred pounds sterling. This has been accumulated from time to time over and beyond the amounts needed by those dependent upon it, and not only serves by the interest it earns to still further assist this charitable work, but gives to it a permanency, and stimulates professional pride and this noble and unselfish phase of professional loyalty.

During the time covered by the report, say about one year, some two thousand five hundred dollars were contributed to this fund. Of this, about two thousand dollars were distributed to disabled dentists, or the widows or children of dentists deceased. Nearly five hundred dollars of the year's receipts were carried to the investment account. The reports which have been from year to year published by the managers of this fund have been interesting reading. In a quiet way it has done a world of good. It has relieved dire distress, made comparatively comfortable the declining years of old practitioners and their wives, and assisted in the education of their dependent children. It is doing more than this. It is undoubtedly a factor in keeping up that *esprit de corps* which has brought into the national association nearly one-fifth of the legal practitioners in its bailiwick; this, when we consider that local dental associations or branches are scattered all over the land, is, indeed, an excellent record.

During the meeting Mr. Cunningham read the seventh report of a committee appointed by the Association to make a collective examination as to the condition of the teeth of school-children. It, as well as those which have preceded it, are well worth the attention of those interested. They are carefully written, and contain valuable information upon an interesting subject. They cannot, however, be usefully condensed without careful and close study.

The papers and demonstrations covered very well, indeed, the whole field of dental practice, and make a commendable showing of useful up-to-date work. Reluctantly passing the others for want of time, I ask attention to two that impress me as being especially suggestive. First, a paper by J. Smith Turner, M.R.C.S., L.D.S. (Eng.), entitled, "On Matters Connected with the British Dental Association," first answers the question, What is the use of registration? In so doing he defends those who arranged the details of the dental act, contending that they acted wisely in seeking to be attached to the Medical Council of Education, that body having already passed through the experimental stage with its unavoidable

confusion and errors. By so doing the dental profession at once entered into a well-ordered and perfected system of registration. This he contended offset the initiatory errors of administration perpetrated by the Medical Council. It has been a long-standing grievance to the dental profession in Great Britain that while they have contributed largely to financially maintain the Medical Council, they have not been permitted representation in that body. It has required a long, persistent, determined struggle to acquire, by the appointment of Mr. Chas. S. Tomes, that which they have from the first considered their legal right,—to be represented by one of their own members in the body to whom they have committed the well-being of their calling.¹ To many the seeming indifference, the derogatory remarks, and the dilatory manner associated with dental business in the Medical Council has raised the question whether association with that body has not been a deterrent; whether it would not have been better to have “gone it alone.” It is to these Mr. Turner first addresses his remarks. He next turns to the student who has just received his diploma, and urges him not to rest satisfied with the honors it confers, but to at once make his title legally and honestly complete by the act of registration. He next urges the importance of being enrolled as a member of the national body, an association that, notwithstanding its shortcomings, is the embodiment of the wisdom of the dental profession, and has on its roll of members all that is best and all that is noteworthy in our calling on both sides of the Tweed and in the sister island. He then refers to the advantages offered by the national association, socially, professionally, and educationally; notes the inconvenience to those residing remotely from the place of meeting, no matter where the place of meeting may be, an effort to attend its meetings involves; and closes with an earnest plea that, in addition to membership in the central body and attendance on its yearly gatherings whenever possible, as a supplement thereto, membership in and active co-operation with some one of the local branches. He suggests that the local branches should be so located, and their area so restricted, as to, as much as possible, make their meetings readily accessible to all their members. Useful as they undoubtedly are, however, they are necessarily local, he contends, and have the tone and color of a local meeting. They lack that subtle influence, the broad and liberal views, which so greatly modify local prejudices,

¹ Dental Record, vol. xviii., April 1888, page 224.

and the cosmopolitan character which gives to the annual meetings of the National Association so great an impetus to mental activity and expansion.

Mr. F. J. Bennett, M.R.C.S., L.D.S. (Eng.), in a paper entitled "The Ending and Mending of Caries," suggests that the old maxim, which says, "What can't be ended must be mended," represents the point of view from which a large majority of dentists regard the subject of dental caries. They cannot end the advent of caries, therefore they devote all their energies to mending its destructive effects. He further suggests that the success in mending has tended to lessen the desire to end, or, rather, in the sense in which he uses this word, to prevent that which makes mending necessary. Had there been less resource in the mending; had the case admitted of no half-measures; had the dangers of caries been more deadly, more widespread attention and an unremitting effort to the discovery of a prevention and ending of caries would have been made. He reviewed the efforts made to discover the cause of caries which have led up to the present accepted theories, and, reasoning from the success attending preventative measures in lessening other germ-caused diseases, urged that there was in this sufficient encouragement to stimulate effort to find some practical means of lessening if not ending the necessity of mending dental caries.¹

The social features of the meeting appeared to have been especially pleasant. Owing to the serious illness of the president, Dr. Stack, Sir Edwin Saunders was called upon to take his place. The approaching fiftieth anniversary of his wedding was pleasantly alluded to, and later on was fittingly celebrated.² Next to the late Sir John Tomes, Sir Edwin Saunders has been foremost in making dentistry in his native land the respected calling it is to-day. His presence at any dental gathering will ever be an inspiration.

The well-known *British Journal of Dental Science* completed with the close of the year its forty-first volume. It lacks the stateliness of the official journal; its contents are more varied, and largely drawn from other journals. They are, however, in the main, judiciously selected and properly credited. Its original matter is rather largely composed of papers written by students and read before student societies. In the July number, page 644, this is editorially noted as having been complained of by subscribers, and is

¹ Journal of the British Dental Association, vol. xix., August, 1898, page 601.

² Ibid., vol. xix., 1898, page 789.

there defended, the writer saying, "We must not forget that we were all students once, and must also remember that it is a great incentive to a student to take the trouble to compile a paper when he feels that what he has written will appear in a journal read by those among whom he hopes shortly to rank." There is doubtless truth in this, and possibly the kindly reception of these maiden efforts and the encouragement thus given may be followed in time by more serious and more matured contributions that otherwise the profession would miss. The youngster who to-day quotes so largely from his text-books, and who is encouraged by seeing his paper in print to continue his contributions to his profession's literature, may shortly with equal zeal pry into nature's secrets or write text-books himself. I am impressed, however, that the college journals so common on this side, dental journals published by students for students, more fully "foot the bill." The publication of such papers in a journal intended for practitioners, by crowding out more valuable matter, makes it less valuable to those for whom it is intended, who have no interest in these juvenile essays. It also leads more experienced writers to avoid it.

Its editorials are usually well written, and are upon topics of general interest. One in the number for May 15, page 458, upon "Reciprocity," commends the work of our National Association of Dental Faculties in levelling up the educational standard of dentistry in the United States. It compares their work with that of the General Medical Council, which is doing the same for the profession in Great Britain. The writer has, of course, his little ding at American dental colleges; nevertheless, he looks upon these two bodies as preparing the way, perhaps it may be in the far distant future, for international educational reciprocity. It probably may not, he suggests, come all at once. It may be that in this interchange of diplomas they may be accepted first in part only, the holder being required to make up by added study that portion of the curriculum his diploma does not cover. He makes no note of the commercial features which have in this so large a part, and are becoming more and more controlling factors in all forms of international reciprocity.

The *Dental Record*, a monthly journal published by the Dental Manufacturing Company, in the information it furnishes, caters more closely to the dentist's practical needs than either of those I have noticed. On page 55, W. H. Gilmore, L.D.S., treats of the "Debatable Points in Anæsthesia." The subject of anæsthesia has

with them occupied a large share of professional thought. Notwithstanding frequent fatalities, chloroform seems to be largely used on the other side, and was responsible for nearly one hundred deaths during 1898 in Great Britain alone. When we remember that it is in most cases administered by a medical practitioner, the dentist not being educated, it is supposed, sufficiently far in medical matters to be trusted with the administration of anæsthetics, these repeated records of death under anæsthetics in the dental chair are astounding. It has been questioned whether, indeed, the caution is not really responsible for this alarming fatality. Withholding from the dental student the information and the *practice* needed to make him fully conversant with the phenomena associated with anæsthesia for dental purposes and in the dental chair, and assigning this delicate operation to one who, however skilful in its use at the surgical clinic or the parturient couch, is here entirely out of his element, seems to be a serious mistake, too often a fatal one to the unfortunate patient. When we remember that anæsthesia was introduced by dentists, its lines of safety and of danger mapped out by dentists, the most approved instruments for its use invented by dentists, it seems very strange to raise the question whether or not a dentist should be allowed to administer it. And yet this question is, on the other side, not only frequently discussed, but is generally decided that his medical education is too limited if his qualification is dental only; and yet they charge that a graduate of an American dental college whose right to do this has never on this side been challenged, and who has for half a century fully proved his competency to so do with safety and success, is, compared with their graduates, an imperfectly educated man! The debatable points noted by this writer are, whether nitrous oxide has been more a blessing or a curse; whether, when a medical man is called in to administer ether or chloroform, it should be the patient's ordinary medical attendant or an expert anæsthetist selected by the dentist; lastly, who shall choose the anæsthetic? Regarding this last, he holds that the dentist should be allowed to ask for any anæsthetic he prefers. If, however, the medical man should decide that the patient's physical condition contraindicates the anæsthetic chosen, the dentist must then give way, placing the whole responsibility upon the anæsthetist. The latter seem to have become specialists, having a society of their own. Complaint has been made that medical men fail to appreciate the importance of those precautions and that care usually surrounding the use of anæsthetics in surgical cases when called upon to use an

anæsthetic for tooth extraction. In the presence of the surgeon the anæsthetist is the assistant; in the presence of the dentist he is too apt to feel that he is the *master*, and is there to "boss the job." I note a variety of devices to prolong the effect of nitrous oxide without increasing the danger of its use. Some seek to accomplish this by continuing in various ways its administration through the nose or mouth during the operation; others by combining it with ether, or by using a little ether immediately after the gas. Those interested in this matter will find several well-written articles describing these methods in last year's *Dental Record*.

On page 251 a patented artificial or dummy patient for students to practise on is illustrated, and in a later number appears a dispute as to who first introduced the device. Before settling that point it will be well for the contestants to confer with our friend, Professor J. Foster Flagg, who for many years used the same ingenious device in his lectures and clinics.

Taking it all in all, as a practical journal, the *Dental Record* deserves first place among the English dental journals, and has, during the year under review, kept its readers as well informed as one journal can of all matters of current interest concerning the practice of dentistry and the dental profession.

The *Dentist*, published monthly by Hampton & Co., 13 Cursitor Street, London, England, a new venture, made its appearance January, 1898. It claims to be an independent journal devoted to the interests of the dental profession.

I note a new feature, and perhaps a desirable one. Each number begins with a few pages entitled "Notes of the Month." These are a series of disconnected paragraphs noting recent events, professional and otherwise, of general or local interest, or directing attention to new ideas or devices, or to articles or special points brought out by contributors in the current number. They are not abstracts from other journals, but brief, original, newsy notes. Judiciously edited, I am impressed, it may be made a desirable feature,—one not uncommon in unprofessional periodical literature, and usually appreciated.

Chloroform, as an anæsthetic, is discussed at some length in the earlier numbers, especially in reference to Dr. Snow's method of administration, and the deductions his long experience in its use and close observation of its peculiar effects led him to formulate. In one of the monthly notes (April, page 118) he is styled "The Father of Anæsthesia" (?), and it is there suggested that a monument

to him should be erected in the city of York, where he was born. Another note on the same page reads as follows: "The most emphatic testimony yet borne to the value of Snow's life-work is the fact that no one has disproved the truth of his conclusion that twelve minims of chloroform, slow-progressively administered, can have no other effect in an adult than loss of sensation without loss of consciousness. Eighteen minims, loss of sensation, consciousness, and motion,—all that is required in any ordinary surgical operation. Twenty-four minims uniformly diffused in the blood produces thorough relaxation of the muscles, only required for the reduction of long-standing dislocations; and further than this, Snow's fourth degree, chloroform should never be pushed."

The writer contends that had this rule been observed from the first not a single accident would have occurred from its over-administration, to which alone, he says, death from chloroform is due. On page 54 is an article describing an apparatus, made by Mr. Krohne, designed to carry out the Snow method, and on page 120 this is further explained and illustrated. The object sought is to know visually how much and how rapidly the anæsthetic is being given and the relation it bears to the atmospheric air given with it.

While the first volume of this new journal contains much of value, there is much room for improvement. It can hardly be considered, in any respect, a better professional journal than its competitors. It began its second volume as a weekly.

Glancing over the field the two most important events of the year have undoubtedly been the appointment for five years of Mr. Chas. S. Tomes as a dental representative upon the General Medical Council, fortunately, owing to the death of Sir Richard Quain having made an opening, in time to take part in the second important event, settling the long unsettled dental curriculum in so far as the General Medical Council's authority can so do. Its recommendations are only advisory; they will, however, no doubt, be as closely followed as circumstances permit.

In conclusion. Quite a large space in all the journals is given to reports of actions at law to enforce the various phases of the Dental Act. While this may be wise to a certain extent, they do not, so fully and so frequently reported, make interesting reading. When in addition the private misfortunes of dentists, which have no bearing whatever on professional matters, bankrupt proceedings, infractions of the moral law, divorce scandals, business disagreements

or misunderstandings, or other legal matters in which a dentist, through fault of himself or of others, is brought, willingly or unwillingly, into court, are thus repeated, they seem very much out of place in a dental journal. I am very sure it would not be tolerated on this side. It is not my purpose, however, to criticize; but rather to prompt a more general reading of these journals, and thus promote a more generous interchange and understanding of international dental thought.

Reports of Society Meetings.

NATIONAL DENTAL ASSOCIATION.

(Continued from Vol. XX., page 795).

Second Day.—Evening Session.

THE Association was called to order at 7.30 P.M., Vice-President S. H. Guilford taking the chair. The report of the Committee on the President's Address was read by the chairman of the committee, Dr. James McManus.

On motion of Dr. Crouse, the proposed amendments to the constitution were referred to the committee on revision and the report of the committee was received.

After the transaction of some minor routine business the hall was darkened for the exhibition of stereopticon views, and Dr. C. Edmund Kells, New Orleans, read an illustrated paper entitled "Röntgen Rays."

Dr. Kells, in his paper, reviewed the history of this marvellous discovery, beginning with a sketch of the study by Dr. William Crookes of the properties of matter in high vacuum, and the construction of the "Crookes" tube. For seventeen years the studies of scientists all over the world were devoted to the effects produced within the latter by the cathode ray, Wilhelm Röntgen, of Würzburg, being the first to discover the more important effects produced beyond the confines of the glass walls of the Crookes tube. The history of this great discovery was given briefly by Dr. Kells, and illustrated by pictures thrown upon the screen of the apparatus for

exciting the tube, and of the means for utilizing the "X-ray" as it is produced. Dr. Kells also described the means devised by himself to prevent the puncture of the tubes when used upon the Tesla coil. The paper concludes with an interesting *résumé* of the uses of the Röntgen ray in dentistry and the requirements for obtaining the best results in the least time. By Dr. Kells's methods the time for producing a "radiograph" or "skiagraph" of unerupted teeth, etc., runs from twenty to forty seconds in the thinner bones to as high as one hundred and twenty seconds for third molars in heavy jaws, several pictures being obtained at the same time, if desired, by using several celluloid films superimposed one upon the other.

Other papers read at this session were "A Study of Harelip and Cleft Palate" (illustrated), by Dr. Thomas Fillebrown. "Some New Points in the Anatomy of the Face and Jaws" (illustrated), by Dr. M. H. Cryer. (These papers require the illustrations.)

Dr. Grevers, of Amsterdam, read a paper on "Dental Nomenclature." This paper was illustrated by photographs projected upon the screen showing the different occlusal conditions, normal and abnormal, for which Dr. Grevers proposes a nomenclature based upon the Greek root with various prefixes, as, *en*-armosis, normal bite; *eph*-armosis, projecting mandibulæ; *pros*-armosis, edge to edge bite; *oph*-armosis, open bite; *dieh*-armosis, cross bite; *odorith*-armosis, occlusion of the teeth, etc.

Third Day.—Morning Session.

The Association was called to order at 9.30.

Dr. H. A. Smith, Chairman of the Committee on Code of Ethics, presented a code based upon that adopted by the American Dental Association in 1866, which, after some revision, offered by Drs. Harlan, Patterson, and Taft, was unanimously adopted.

Dr. J. Y. Crawford offered the following resolution, which, after discussion by Drs. Jarvis, Truman, and Gordon White, was adopted:

"WHEREAS, The National Dental Association deems it a duty to express its condemnation of the continued forcing of politics with the formation of State Examining Boards; be it

Resolved, That while such bodies are of service to the public when composed of strictly competent men, they are a decided evil, and a disgrace to dentistry, when self-seeking and unprofessional individuals are placed upon such boards solely through political influence."

Dr. Stainton, chairman of the committee appointed to examine the conduct of the affairs of the Dental Protective Association, reported that the committee had examined the books and vouchers of the Association and found everything correct. It was to be regretted, however, that but eight hundred members had paid the second assessments permitted by the by-laws of the Association.

Dr. W. W. Walker desired that Dr. Crouse would be asked to explain the meaning of an article in the *New York Herald* in regard to a law-suit claimed to have been just won by the Sheffield Tooth Company.

Dr. Crouse stated that the attorney of the Association would be in attendance on Friday morning, when a meeting of the Dental Protective Association would be held. All members of the profession were invited to be present, as matters of the greatest importance to every dentist would be presented.

Dr. Wedelstaedt, of St. Paul, read a paper entitled "Cements."

He said that cements having been in use for the past thirty years, it seemed strange that it had not been recognized that the majority of those in use are very readily penetrated by moisture. If each man, the next time he uses cement, will mix a little more than is needed and place the residue in a bottle of ink for from twenty-four to forty-eight hours, he can readily ascertain the extent of penetration of moisture. If he finds one that is not penetrated, that is a good one to stick to. If the ink can penetrate a pellet of the cement, saliva can penetrate it, and where saliva can penetrate, micro-organisms can penetrate also.

Dr. Wedelstaedt then produced a number of glass tubes containing an aniline solution, in which, on the 12th of July, masses of mixes of different cements had been placed.

Those in one tube had been covered with sandarac varnish; another in hot melted paraffin; the third had no preparation.

Dr. C. N. Johnson was requested to remove the cement cubes and report the result.

1. Those without varnish or paraffin showed considerable penetration by the aniline.

2. With sandarac there was some penetration.

3. With hot paraffin the penetration was also quite considerable. The "fillings" or masses of cement were each seven millimetres in diameter by twenty-two millimetres long.

After the examination Dr. Wedelstaedt further said that penetration was but one of the evils to be overcome; there was also con-

traction and expansion of the mass, some of his experimental fillings showing an expansion of two millimetres beyond the cavity, while in others there was marked contraction running completely around the filling. Various experiments were made, as by mixing the powder of a cement that leaks with the liquid of one that expands, and *vice versa*. A microscopic study of the powder of different cements gave some surprising results, bits of wood, hair, cotton, etc., having been found.

Age also has a remarkable effect upon cement fillings, as tested by the dynamometer, the resistance increasing very rapidly with age. In one case, in which a cement carried but thirty or thirty-five pounds at the end of twenty-four hours, more of the same mix carried four hundred pounds after ninety-six hours, the practical lesson being not to place metal fillings on freshly placed cement.

When we make a demand for cements that will neither shrink nor expand, and which moisture will not penetrate, we will get them, and the better it will be for our patients.

From the examination of the samples presented, Dr. Johnson said that not one of the cements experimented with was fit to use as filling-material for teeth.

Dr. W. V. B. Ames, Chicago, read a paper entitled "Some Phases of the Cement Question."

He said that in the consideration of the physical properties of filling-materials the cements should have a share of attention. The paper dealt with the questions of the crystallization of cement liquids, of coarse *versus* fine powders, of shrinkage and expansion, and of the arsenical contamination of cement powders. The crystallization of the liquid has been the bugbear of cement manufacturers. Crystals separate from the fluid, either held in suspension, settling at the bottom of the bottle, or adhering to its sides. As these crystals were originally part of the solution, evenly distributed throughout, their separation and loss must impair the virtues of the original formula. They may, however, usually be liquefied by heat, or, if everywhere distributed through the liquid, may be rubbed down and liquefied in the mix of the cement. As to the degree of fineness of the powder in dynamometer tests there is an increase of edge-strength up to a point somewhat short of impalpability. We may expect greater strength of contour when a slight grit is discernible, but it is reasonable to suppose that the granular state may detract from the ability of the mass to withstand long-continued attrition. Powder that is too coarse for inlay-setting may be suitable for contour.

On the question of shrinkage and expansion he said that when the phosphoric acid has been modified by alkaline phosphates only, the basic phosphate which is formed is of a friable nature, and exerts no special force in drawing together the granules, making evident shrinkage at the periphery. But when the acid has been modified by non-alkaline phosphates, the basic phosphate formed agglutinates the zinc oxide granules, drawing them towards the centre of the composition, giving a tendency to a diminution of volume towards crystallization, depending on a lack of water of crystallization which, if present, would give too rapid setting, but which, if added to the crystallizing mass, will be taken up and give the difference between shrinkage and expansion. When the mass is allowed to harden in a tube in the dry state, wholly unlike conditions present to those existing when the same cement is used in the mouth. The practical lesson from this is that cement fillings are not benefited by being kept dry for an indefinite period, that there is a disadvantage rather than an advantage in long-continued protection from the saliva, in the use of the cements in which the phosphoric acid is modified by non-alkaline phosphates.

The arsenical contamination of cement powders is easily demonstrated, but the zinc-arsenic compound is inert and wholly devoid of poisonous properties *per se*, and is not broken up to the extent of forming potent arsenous acid except under rare conditions, so that the infinitesimal arsenical contamination may be ignored.

In repeated tests it has been proved that the death of a tooth-pulp will not be caused even by the long-continued proximity of a liberal portion of this zinc-arsenite. Sensitiveness of dentine is not decreased by its application, and the pulp subsequently presents all the appearances of normal vitality.

In the discussion of the subject, Dr. G. V. Black said that it was greatly to be desired that the physical properties of the cements should be investigated by competent persons, for, although it is being looked into, it has not yet been shown that we have a reliable cement to-day, one that will do what cement fillings are expected to do. They are utterly unreliable even for covering in arsenical applications. Unless each batch is tested we do not know whether it is going to shrink or expand. From observations made in his own laboratory he has found that in a well-prepared cavity there was sufficient shrinkage in an hour or so to let enough arsenic out on to the gum to cause arsenical poisoning, a shrinkage that could be seen with an ordinary magnifying-glass. We should therefore use the

utmost caution until assured by experience of the quality of our cements.

Dr. Patterson said he did not see how it could have been possible for *Dr. Wedelstaedt* to make a perfect mix of cement in such large masses. The cylinders are chalky and crumbling.

Dr. Wedelstaedt said that only one of the "fillings" presented was made from a mix, and that the mixing was thoroughly done.

Dr. Crouse hoped that more men would take up this work, so that we would eventually have a cement that would not shrink, that would not be porous, and from under which arsenic could not escape. As yet we know but very little about the properties of the cements, although we use them daily and rely upon them more or less.

In closing the discussion of his paper, *Dr. Wedelstaedt* described more exactly the methods used in making his test fillings, and said that it was only through such experimental work that one could hope to obtain an improved cement.

Dr. Ames said that from his own work in this direction he had reason to believe that the tendency to shrinkage would yet be overcome, and that we would eventually have a cement that would be impervious to moisture.

Dr. G. V. Black, Chicago, next read a paper entitled "Susceptibility and Immunity to Dental Caries."

These questions have not had the amount of consideration by dentists that their importance demands. Caries is and has been so common that it has come to be considered that practically all are so afflicted.

And yet there are a sufficient number of exceptions for all who have been long in practice to have known some persons who have been wholly immune during a long life. This has been in the past attributed to the superior quality of the teeth; but it has been proved that this is erroneous. Caries is not dependent upon the teeth, for all human teeth are nearly the same in their calcification, though in their physical structure there are wide differences,—developmental grooves are imperfectly closed, leaving fissures, pits, and openings; the dentine may have interglobular spaces; granular areas in which there is much of physical imperfection. But these imperfections are in no proper sense a *cause* of caries of the teeth. They are proportionately as frequent in persons immune to caries as in persons whose teeth decay. These imperfections at most only give opportunity for the action of the causes of decay when the cause is pres-

ent and active. It is an error to look to the teeth themselves for the answer to the question *why* some teeth decay and others do not. In caries the teeth are acted upon; they do not themselves act in the premises. The agents acting to produce decay are outside of the teeth, and must be found in their environment,—*why* the cause which is active in some and not in others has not been reduced to demonstration. It is certain that caries has its beginning only when the conditions of the oral secretions are such that the micro-organisms causing decay form gelatinous plaques by which they are glued to the surface of the teeth. This seems necessary to the starting of the process of decay. So long as the micro-organisms have no protection from the dissipation of the acids they form they cannot produce caries. If the saliva was even sufficiently acid to act upon the teeth they would decay all over instead of at selected points of beginning. The organisms grow in every mouth, but the formation of the gelatinous plaques does not occur in every mouth, and this seems to depend upon something in the saliva, the nature of which is yet unknown. The gelatinous plaque of the caries-fungus is a thin, transparent film, revealed only by careful research, and not to be confounded with the thick mass of *materies alba* so frequently found upon the teeth; nor is it the whitish, gummy material known as *sordes*. Research for the factors which predispose to caries should be directed not to the teeth themselves, which are the most unchanging of the tissues of the human body, but to the surroundings of the teeth,—the oral fluids and the bodily conditions which give character to the secretions, which are affected by the slightest causes. With our present knowledge it may be stated that the susceptibility to caries of the teeth is influenced by heredity, by age, and by fluctuations of bodily condition. The hereditary predisposition to caries is of first importance, as with children living under conditions similar to those of the parents in their childhood the susceptibility to caries will be very similar in the majority of cases, even to the particular teeth and the localities liable to be first attacked. Caries in its most practical aspects is a disease of youth. The hereditary predisposition disappears with the coming of adult age. The beginning of nearly all cavities occur early in life, and the effect of early radical treatment by filling is that the person becomes immune at the time of life at which caries would be making its worst ravages if the filling had not been done. This immunity relates to the beginning of caries rather than to the progress of cavities that have begun. This is partly due to better care, the better care being due

to the better conditions which rendered the better care possible, the teeth being placed in condition for full and natural use in the mastication of food and the natural abrasive action of the excursions of food with its effect in natural cleansing. This is the most important element in bringing about an early abatement of susceptibility to caries. Reacting in a general way, a better condition of the secretions is produced. It is for children, therefore, that the most perfect operations are demanded in order to maintain the full, free, and efficient use of the teeth. A failure of vigorous mastication seriously retards the coming of immunity. Clinically, the results support the practice of making permanent fillings for children, although this has been severely criticised. It is true that the pulp occupies larger space, but this simply demands corresponding care and judgment. Judicious management is required, but if proper means are employed the endurance of the child will be sufficient; but the courage of a child should never be broken down, and the nervous system should be looked to with the greatest care. When from any cause whatever permanent operations cannot be made, the case must be tided along with palliative treatment until better conditions obtain.

Fluctuations between susceptibility and immunity occur, not dependent upon changes in the tissues of the teeth, but to changes in the environment of the teeth, in the secretions, and, possibly, in the cellular elements of the general body. These changes in the character of the secretions are often coincident with what seems to be the best of health. That they are frequently coincident with ill health of one kind or another seems to be merely a coincidence, and it does not appear that any especial form of ill health particularly predisposes the teeth to caries. Local immunity is due not to difference in the tissues of the teeth in the favored localities, but rather to environment, certain localities favoring the building and protection of the microbic plaques.

Without careful consideration of the question of environment and comparison with what occurs in conditions of susceptibility, clinical experience will lead to conclusions very wide from the facts.

Dr. J. T. Crawford (Chairman of the Section).—From the moral and the philosophic stand-point the papers of Dr. Black and Dr. Johnson are so nearly alike that I will ask that Dr. Johnson be permitted to read his paper now, and that the two be discussed conjointly.

Dr. C. N. Johnson accordingly read his paper, entitled "Management of Children's Teeth."

In the management of the deciduous teeth the object is usually to do merely palliative work, keeping the patient comfortable for a few years until the permanent teeth have taken their place.

With the permanent teeth, even those which appear early in life, the aim should be to give the greatest possible permanence to the operations, with the idea ever in mind that the highest possibilities in dental art involve saving those organs for a lifetime.

The assumption that the deciduous teeth may be neglected because they will eventually be lost should be combated at every opportunity.

There is not only the possible suffering and injury to the health resulting from diseased and abscessed teeth and lack of mastication of the food, but there is the question of acquired habits which may conduce to permanent injury. The habit of bolting the food unmasticated, and, therefore, unfit for service, often clings through life. Effective mastication is a weighty factor in the health and longevity of the individual, and it is all-important that the teeth of children should be kept in such condition as shall conduce to habits of thorough mastication. The materials for filling the deciduous teeth are limited to gutta-percha, cement, and amalgam. Cavities in the anterior teeth are usually shallow, and it is not generally possible to establish perfect outlines; the decay can only be removed, more or less thoroughly, and a material used that can be placed against the surface and remain by its own adhesive properties.

In the deciduous molars, which are retained longer, occlusal cavities are easily managed with either cement or amalgam. If cement is used it should be inserted with considerable pressure, carrying it forcibly into every groove or inequality of the surface, for which purpose the index-finger of the operator may serve. The occluso-proximal cavities are more difficult to manage because of the almost universal sensitiveness. The separation of the teeth from the expansion of the jaw and the limited contour of the fillings leads to pockets between the teeth which become a source of discomfort. In desperate cases it may be advisable to bridge across the interproximate space, for which purpose gutta-percha is excellent, though, as it is easily worn out, amalgam is probably the more serviceable material for these cavities. A great aid in securing firmness for these bridging fillings will be found in placing a metal bar across the space, building the fillings around and over it. If a pulp

is exposed in a deciduous tooth, syringe well with tepid water and remove anything causing pressure on the pulp. Then apply oil of cloves on a pledget of cotton the size of a pin-head, and cover with dry cotton and fill the cavity over this. Oxide of zinc and oil of cloves makes an anodyne and antiseptic paste which may be flowed over an exposed pulp and protected by a filling of gutta-percha or cement. This will keep the pulp comfortable while it dies, and after a week or two the canals can usually be cleaned and filled. The pulps of deciduous teeth are not tenacious of life, and it does not require arsenic to kill them. If abscessed they should be cleaned by mechanical means and packed with cotton saturated with oil of cloves, and pressure made by means of unvulcanized rubber packed in the cavity till the oil of cloves comes out of the fistulous opening. The tooth may then be filled. The pulp-chamber should be flooded with a solution of gutta-percha in eucalyptol, and some temporary stopping forced into each canal until the eucalyptol shows at the opening of the fistula. They will rarely give further trouble.

The management of the permanent teeth in childhood is one of the most important problems. The teeth which suffer the most from decay are those which erupt earliest. The first permanent molars are called upon to do longer service than any other teeth, and have a very important function in the dental arch during the growth to full length of the bicuspid and second molar. If not kept in position the jaws are allowed to drop too close together, so that the upper incisors overlap the lower more than normal, and the bicuspid and second molars never acquire their full length and true position. Every effort should therefore be made to preserve the first permanent molars. On the slightest approach of caries they should be carefully filled. If they apply late, build them up, or crown if necessary, rather than yield them to the forceps. The material to be used is governed entirely by the ability of the patient or the disposition of the patient to withstand dental operations. If decay occurs on the occlusal surface during the period of the tooth's eruption through the gum the most serviceable material to check the disease is cement, which will prove effective in tiding the tooth over till it is fully erupted. Even when the flap of gum has not entirely receded, when the tendency to decay is great, it is well to use cement as a preventative, forcing it into the grooves and sulci of the occlusal surface, renewing it until conditions make it possible to insert metal fillings,—“conditions” relating to expediency and forbearance on

the part of the patient to withstand tedium and pain rather than to any pronounced change of structure. As to the choice between gold and amalgam this is subject to two considerations,—one of expense, the other of ability of the patient to submit to gold operations without undue nervous strain. We must not jeopardize the nervous system of our young patients in the blind effort to live up to some high ideal. It is a question of physical and mental stamina on the part of the patient. When the area of the cavity is not too great, gold- and tin-foil rolled together is a useful material for filling these occlusal cavities, but it cannot be depended upon to wear well in cavities with a broad masticating surface.

The mesial surface of the first permanent molars calls for the most careful attention, as it is in contact with the second deciduous molar, and, if the latter is affected on its distal surface, the former is almost certain to suffer. It is well in many cases to grind away the distal surface of the deciduous tooth, rendering it more easy to keep the mesial surface of the permanent molar clean. If decay occurs it may be controlled with gutta-percha, or cement may be used, though it cannot be depended upon for any length of service. As soon as the deciduous molar is lost the permanent molar should be promptly filled with gold before the eruption of the second bicuspid, and the metallic surface should be made sufficiently broad to render the operation as permanent as possible. If the occlusal surface also is involved, a combination of gutta-percha and cement makes the best temporary filling, laying the gutta-percha over the cervical third of the cavity. The care of the permanent incisors calls for careful consideration. If decay occurs early it is usually best to resort to cement or gutta-percha, and the patient judiciously schooled towards an attitude of sufficient forbearance to submit to gold operations as early as may be practicable.

Discussion of these papers was made the special order of business at three P.M.

Dr. James Truman next read a paper entitled "Reflexes from Lower Molars."

(For Dr. Truman's paper, see Vol. XX., page 641.)

The Association then adjourned to two P. M.

(To be continued.)

ACADEMY OF STOMATOLOGY.

THE regular monthly meeting of the Academy of Stomatology was held at the rooms of the Academy, 1731 Chestnut Street, on the evening of October 24, the Vice-President, Dr. J. T. Lippincott, in the chair.

A general discussion upon the subject of "Cavity Preparation upon Mathematical Lines" was opened by Professor S. H. Guilford.

Professor Guilford.—The president of the society called me up over the telephone last week and asked me to prepare something for this meeting. I declined, because I felt that my hands were full. However, he seemed to feel that the first meeting of the year should not be devoted entirely to sociability, as it would be a bad beginning. So I finally consented to speak upon this subject, which was of his selection. I did not have time to prepare a paper, nor to prepare myself adequately to speak upon the subject suggested. I have simply reviewed it in the time I had, and selected some models and charts I happened to have at the college to illustrate my remarks.

Cavity preparation upon mathematical lines is a subject that has interested our scientific men during the past few years, but has never received much attention at the hands of the profession in general.

When Dr. Black was preparing his work on the forms of teeth, he felt interested in having some accurate measurements in order to prosecute the work. For that purpose he used an instrument, the cavity micrometer, and calipers for making these measurements. A year and a half ago, while preparing a paper on instruments, he used a millimetre gauge. It had occurred to Dr. Wedelstaedt, of St. Paul, to measure cavities by this instrument, and he seemed to think an advantage could be gained by measuring in a very exact way. He said, first of all, that the dental profession was not scientific enough nor exact enough; that we were in the habit of talking loosely and without conveying exact ideas; that all we talked about was large cavities, medium-sized cavities, and small-sized cavities; that those terms did not express anything definite, and the only way to get at the matter was to make measurements and express what was meant in millimetres. He also said that if anybody could point out to him what was meant by a medium-sized cavity he would be grateful to him. So he took up the matter and had an instrument made that would measure the depth of a cavity, and he made measurements with this instrument, and afterwards read a paper before

a dental society in which he detailed his work, presented a tabulation of his measurements, and argued the advantage of measuring cavities carefully.

He claimed that dentists were unable to state the exact size of a filling to be put in a tooth without a correct measurement, or to know at once what amount of gold it would take to fill a cavity. Consequently, he declared, it would be more scientific if we had some data to go by. He spent a great deal of time over the matter, but, judging by the discussion that followed the reading of the paper, it failed to make an impression as to its practical value.

With regard to the crown of the tooth, much was done by Dr. Black, but he did not carry his work beyond reasonable limits. He thought that in making a section of a tooth it would be very well to be able to know the thickness at certain points, especially with relation to the pulp. All these things were very well to know, but I do not think he convinced any one that there was any practical value in it, although he spent a good deal of time upon it. I simply mention this matter in order to get the opinions of those who are present. For myself I would say that dental cavities vary so much in their outlines that measurements would be of very little value.

In preparing an occlusal cavity we do not care so much for the dimensions as we do for its proper cleansing, extension, and shaping. In many cases the decay has progressed to different degrees of depth, so in measuring we might measure to the deepest point. In such a case it would not do much good if the cavity were mapped out upon the record. Where we have a flat floor we may make a measurement, but in seeking to get a flat surface we may be inclined to cut away a great deal more of the tooth than we would be justified in doing.

Dr. Wedelstaedt mentioned the matter in connection with the identification of dead bodies, and that after a cavity is prepared a measurement from the cavity floor to the gum line should be taken, and then the cavity filled up with whatever material it is decided to use, when a measurement from the occlusal surface to the gum line is to be taken and these measurements recorded. He said that in this way one would have a record of everything done for each individual which would prove valuable in court.

He did not make any explanation of how a record of one dimension of a cavity would be of any particular use. The only dimensions one would really have would be those of the outside. He spoke of taking a vertical and transverse measurement, and seemed

to be satisfied with them, though they amount to nothing, as they do not give any idea of the cavity. An occlusal cavity may have these two dimensions and yet be oblong in form or oval or perfectly round. If a cavity is to be correctly described one must have a great many dimensions.

Dr. Wedelstaedt went so far as to say that, by measuring a great number of cavities and crowns of teeth in which they occurred, he had been able to fix a definite rule for the size of the cavity. He said that by measuring the length of the enamel on the proximal surface and the greatest width of the tooth, and by taking two-thirds of each measurement, he could get the exact size of the cavity required for a filling that would obviate recurrence of decay. In other words, if the length of the proximal enamel was 9.9 millimetres and the width 7.2, that the cavity ought to be of a size two-thirds of each,—that is, 6.6 long and 4.8 wide.

This brings up another matter that has interested the Western men for some time past, and that is the point which was brought out by Dr. Black in some of his articles in the *Dental Cosmos*, in which he wrote of "extension for prevention." These words had a very smooth sound, and conveyed a definite idea. The idea was that during preparation a cavity should be so extended as to include not only all of the injured surface and the contact point, but to lines which would cause the margins of fillings to be beyond contact from the adjoining teeth and likewise be cleansed by the friction of food during mastication, and that the filling when completed should be as nearly perfect as possible to prevent recurrence of decay.

In speaking of proximal cavities he mentions that on these surfaces of teeth we have an oval contact point, and just above that is the point of the commencement of caries. Now, in preparing a cavity of that kind he felt that we should not only cut away the injured portion actually decayed, and include the contact point, but extend the excavation freely, buccally, lingually, and cervically, making a wide, flat base cervically. He claimed that if the cavity be prepared in the ordinary way,—rounded at the cervical margin,—an area of tooth structure in proximity to the linguo-cervical and labio-cervical angles of the cavity would remain, which, while not showing that it had been affected by caries, would invariably decay in the course of time.

I believe cavities should be extended to include this area.

He advocated extending the cervical wall beneath the gum, as such extension was seldom followed by a recurrence of decay.

He also urged the extension of occlusal cavities to include all the fissures, as otherwise there would be no security against subsequent decay.

When Dr. Wedelstaedt read his paper he was asked whether this plan met with his approval, and he said it did. He evidently believed in it, because he argued on that line all the way through. Whenever the cavity extends nearly to the gum-line there will be no difficulty in cutting beyond it. The question is, first, whether we are justified in doing the cutting, and, secondly, whether the patient will submit to it. Again, the patient may think that, instead of practising extension for prevention, we are practising extension for remuneration, and be dissatisfied.

A few years ago, when I was in Chicago, the question of filling displacements came up, and Dr. Black said that fillings placed in cavities that are rounded at the cervical margin are liable to be displaced, that stress upon the filling would be liable to cause it to turn in its socket or to displace it, and that in order to avoid such an accident the cervical margin should be made flat.

The explanation given as to how this could occur was not satisfactory. I have never had any trouble with displacements in either form of preparation; and if it has not been my experience, I do not see why it should be that of others. In proximal cavities, when necessity for access demands it, or fracture of the occlusal wall is threatened as a future possibility, the cavity should, as a rule, be extended so as to include the occlusal sulcus. This extension gives ample anchorage to the filling, and I have never had such a filling displaced. I cannot bring myself to believe that it is right, even if the patient submit to it, to convert a small cavity into a large one in order to make it more secure. We fill cavities of all sizes, and they last a long time. If in the course of time decay recur, it is not a difficult matter to cut out the injured portion and add to the filling. If made large at first, and in the course of time the filling has to be renewed, it is a very difficult matter to make another filling larger than before.

As to lateral extension along the cervical margin, I see no necessity for it, and cannot bring myself to do it.

Now, gentlemen, I have opened this subject, and I hope it will be thoroughly discussed.

The Vice-President.—Dr. Guilford has given us an interesting talk on this subject, and we will be glad to hear from any one else.

Dr. Darby.—This subject has been an interesting one. I propose

the articles Dr. Guilford refers to are those of Dr. Wedelstaedt, published in the *Dental Cosmos* for December, 1897. The articles in themselves are exceedingly ingenious, very scientific, to the point, and interesting. Dr. Guilford has given us a very accurate description of these papers, and has treated the subject in a very conservative way. There are two sides to every question, and there are two sides to this. I suppose that if we were to analyze Dr. Wedelstaedt's mind we should find him to have a scientific bent, and that he had treated the subject from this stand-point. As an extremist he is correct. We all know that teeth do quite often fail because we do not cut them enough. I have heard it said that we ought not to cut them too much. And I have heard it said that we cut too little. In the later years of life I know we cut very freely. I do not cut, nor does the average man who saves teeth, cut so deeply as Dr. Wedelstaedt advocates. I want to be fully justified by reason in cutting. I occasionally see teeth that were filled forty years ago by old Philadelphia practitioners still doing good service. The cavities were not much larger than two pin-heads placed side by side, but the fillings are still as good as when they were put in. I suppose that if the patients had been in the hands of Dr. Wedelstaedt he would have cut considerably deeper, according to his rule, and to certain lines. I do not think we are entitled to do that always; yet I have no doubt Dr. Wedelstaedt is correct in so far as he advocates cutting freely.

In proximal cavities I do not think it necessary to cut that we may get a flat surface across the cervical border. It is true that if we cut away there we preclude the recurrence of decay at points along the lingual and the buccal margins of the cavity, where we find very frequently that we have fillings to repair. It is to avoid such vulnerable points as these that Dr. Wedelstaedt advocates his practice. To my mind there is a medium ground to be taken in the preparation of cavities. I do not think we are justified in cutting a tooth to pieces for fear of possible decay. It is better to take the chances and advocate care upon the part of the patients.

I place no confidence in the millimetre measurement. We all have good practical common sense, and use that common sense in making the cavity and packing the gold. We have saved teeth for half a century or more. It is not necessary to go to so much trouble to ascertain what size a cavity should be, and I think that perhaps the thing is impracticable.

Dr. Webb advocated the use of the micrometer, and said that we should extend our cavities freely to save the teeth. We know

of no man who cut as freely as Dr. Webb. Dr. Gardiner ought to say something to us that will be valuable.

Dr. Gardiner.—I never could bring myself to cut teeth in the manner advocated by Dr. Black and Dr. Wedelstaedt. I believe in many cases in extending the cavity to prevent decay, but I should be governed by the character of the teeth and the condition of the cavity as found.

I do not feel justified in making a large cavity from a small pin-head cavity. There is no necessity of doing it, and no justice in charging for such service when not required.

In proximal cavities of molars reaching a moderate size, I think it is better usually to extend enough to free the margin from contact, but it is not necessary to carry these cavities beneath the gum. In large-sized cavities I like to bevel all the walls outwardly, so as to protect the margins without weakening the teeth. If your cavities are extended as Dr. Black and Dr. Wedelstaedt advocate, and steps made, teeth are weakened to a very marked degree, especially serious in bicuspid. If much decay exists, then I would cut freely without hesitation, but I would not cut away a large portion of the tooth-substance unless I thought it absolutely necessary. In cavities of medium size I would not consider it advisable to cut. I can say, I think without fear of contradiction, that all radical methods have been failures, particularly in the cutting of teeth. I believe a conservative treatment is always best.

Dr. A. H. Thompson.—I can add very little to what has been said concerning the measurement of cavities. At the time Dr. Wedelstaedt prepared his paper I felt a great deal of interest in the subject, but it did not seem to me to have any practical value.

Extension for prevention was fully brought out by Dr. Black, but may be carried too far. It is true that a collection will form upon the metal and not upon the teeth, and so will not lead to any harm. The shaping of the proximal surface in this manner is a great labor. The only point I can make is that it is valuable that the contact point shall be reduced to be as small as possible to make it more readily cleansed, which is essential for the prevention of recurrence of decay.

Dr. W. H. Truman.—I have read the article by Dr. Wedelstaedt to which reference has been made, and I feel that we are not justified in extending our cavities according to measurement. The time may come when we can do it, but until then a discri-

nating judgment guided by experience will be a far better guide than any other.

The paper referred to, belonging to a series given us during the last few years, seems to be characterized by a mass of impossibilities presented by the writer. He has learned, no doubt, to feel the importance of his suggestions.

Dr. Black has stated that there is nothing at all in the strength of the teeth as we understand it; that they are all equally strong so far as structure is concerned, and able to receive gold fillings.

Now, some of us do not believe that, and to me it seems that while preparing cavities we fail to take into account the capacity of teeth to resist cutting and hammering instruments.

Another point which has been touched upon in the discussion is the malleability of gold. When a gold filling is subjected to the impact of mastication for a time, it will undoubtedly change its shape, so that the fillings in a good many teeth will come loose. Not because they are improperly shaped, not because the tooth has been improperly filled, but because of the impact brought to bear upon the gold. In time it is forced from position by reason of a change in its shape.

I remember some years ago seeing a workman operate upon a piece of metal with a hammer. He sat hour after hour pounding with a heavy hammer a mass of iron six inches in diameter, expecting in a week to force it to fit perfectly the hole in which it only fitted loosely. He had been at it several days. I marvelled at the possibility. I saw it afterwards, and it had swelled out and filled the hole perfectly.

I think in our filling we should remember this, and that it is wise to keep the cavities as small as possible, and utilize extension for prevention only up to a certain point. I have observed that the limit is very soon reached. If we carry it out to the utmost limit, why not put a gold crown on the tooth and have no more difficulty?

Dr. Guilford.—I simply desire to say that my whole object was to bring out discussion. I have succeeded, and I am satisfied.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on Tuesday evening, October 3, 1899, at the office of Dr. John A. Schmidt, No. 1195 Dean Street, Brooklyn, N. Y.

In the absence of the President, Dr. C. O. Kimball occupied the chair.

The minutes of the previous meeting were read and approved.

Dr. Kimball.—The principal subject of the evening is a paper by Dr. Wm. H. Trueman, of Philadelphia, upon "The Status of our Profession and its Educational Methods in England, as shown in Recent Publications."

(For Dr. Trueman's paper, see page 3.)

DISCUSSION.

Dr. S. E. Davenport.—Dr. Trueman's paper seems a very difficult one to attempt to discuss. It is well known that Dr. Trueman is a natural student and a great reader of the literature of the profession; also that he has given much attention to dental history, and we therefore look upon him as authority upon the questions borne upon by the paper which he has read this evening.

It seems to me that he has been very skilful in bringing together so concisely the material from the scattered resources of his information. He has held up to our vision a very interesting representation of some of the sharply defined differences between the educational matters in England and in this country. It is quite evident that Dr. Trueman, while commending our English brethren for many of their ways, would place in the foreground and prefer some of the educational methods and ideas which are in use here. For one moment I almost thought I was listening to Dr. Norman W. Kingsley, when the claim that dentistry is an independent profession was brought forward so delicately. I have always felt a great interest in that claim, and I believe we all have a little leaning of preference for the independence of our profession, and yet, after all, it cannot be denied that we are only humble practitioners of a specialty of that great healing art, medicine.

What Dr. Trueman says in reference to the credit which should be given to those pioneers in our profession, for going out into the open and establishing our dental schools, emphasized the matter none too strongly, and I believe that had it not been for the efforts

of those earnest men the status of dentists in England would have been on a much lower plane than it is.

We are indebted to our English brethren for many things, and we are willing to give credit to them. It seemed very natural to hear many of the names of English dentists mentioned this evening, and we are very much gratified at the prominent position taken in educational matters by the English members of this Institute.

I wish to make my acknowledgments to Dr. Trueman for the success which has attended his work upon this paper, and for coming here in person to read it.

Dr. J. Morgan Howe.—I am sure we are all very thankful to Dr. Trueman for his presentation of this very interesting subject, but it is so large that it is rather appalling to attempt to speak upon it without preparation. It is clear, however, from what we have learned, that the relation of the English dentist to the medical profession is quite different from that which exists here. Dr. Trueman seems to regard our position as preferable, but I am inclined to think that that is an open question, while I rather lean to the other side.

I agree with him that all honor is due to those who established dental institutions in this country, and there is no doubt, I think, that dentistry is far more advanced in this country for that bold and courageous stand that was taken; but having progressed to the state in which we find ourselves, the future rather looks to me like an increasing closer alliance with the medical profession, and that in the future, as in years gone by, we will be benefited by it.

I hardly think that the criticism that Dr. Trueman applies to the dental status on the other side of the water is necessarily connected with their relation to the medical profession. It seems to be due rather to the difficulty of legislating on the subject. Some similar difficulties have been met here, and they pertain, I should think, more to the relation of the practitioner to the public, than to his connection or relation to the medical profession; but there is much to learn by having our knowledge increased regarding the dental professional status in England. I think the paper that Dr. Trueman has been kind enough to present may be a source of great advantage to us.

Dr. Kimball.—It seems to me the thought that the British Association has been taking the lead in the publication of dental journals is one worthy of consideration. It may be that we have suffered in the past from an insufficient mouth-piece of the American

Dental Association, and this thought might well be in our minds, and, perhaps, bring about some change in the periodicals that are published here.

Dr. J. G. Palmer.—It seems strange to me that so large a society, over a thousand members, in addition to controlling a journal, should have sufficient funds invested to enable them to extend a helping hand to the unfortunate ones in our profession. We have nothing like it in this country, showing that we are too much bound up in ourselves, and lacking in brotherly kindness.

Dr. Wm. H. Trueman.—With your permission, Mr. President, I desire to emphasize two points referred to in my paper. First, the very large membership of the British Dental Association; only think of it! out of between four and five thousand legal practitioners, who alone are eligible, one thousand and nineteen were on the roll of this Association when it met in May, 1898. There is food for thought in this, and in the pregnant question it suggests. Why is our National Association, with a far larger field, and four or five times as many legal practitioners in its bailiwick, so poorly supported that it numbers only about one-third as many? In bringing this subject before you I had in view the lesson we might learn from the example set by our cousins on the other side. They are thoroughly organized, and loyally support their professional societies. They work together, and work in harmony; why cannot we?

The benevolent fund, to which I have referred, is seldom heard of on this side. I question, indeed, if many even know of it; yet, what a great thing it is! and so well supported. Possibly there is not the need of it here, and possibly, also, as a national affair, it may not be practicable; and yet cases have occurred when a little help from such a fund could have been deservedly bestowed, and would have been gratefully received. This fund has been from the first faithfully and well managed. I have read and followed up with much interest its yearly reports. No names are ever publicly mentioned, nor are the recipients of its bounty permitted to feel that they are charity dependents. One little incident to show its workings: A dental practitioner, who was educating his eldest son to follow in his footsteps, was cut off in the prime of life. His wife, in rearranging her affairs to meet the changed conditions and provide for her little family, found it necessary to take this boy from school and place him at an employment that would add a pittance to her resources, and it looked as though the life his father had mapped out for him was hopelessly wrecked. The managers of this benevo-

lent fund heard of this, and at once communicated with the mother to ascertain what could be done. Surprised and gratified, she replied, that if they could allow her as much as he would earn, by straining a point she could manage to keep him at school. It was such a pittance they urged her to take more. This she absolutely refused. His education finished, through the influence of the managers of the fund, a dentist was found to accept him as a student without the usual fee, and recently, having finished his professional studies, he has, with bright prospects before him, taken his place as a member of the dental profession, and promises to be a far more useful man in the community than he ever would have been without the little help this benevolent fund so timely and kindly tendered. This is but one of many instances where this fund has stepped in, some very pathetic, and warded off the sharp sting of misfortune. Professional brotherhood is something more than a mere sentiment to men who plan and do such things. It brings and holds together the men who feel that they will not be forgotten if unfortunate, and the men who feel that it is more blessed to give than to receive.

And now the second point, the educational matters. Not living in England, and, therefore, not knowing in their entirety the ins and the outs of it, naturally lessens very greatly my ability, and perhaps my right, to pass judgment upon them; but it seems very strange to me, and I gather from reading that it is not altogether satisfactory to our English friends, that the educational matters of the dental profession in Great Britain should be so entirely in the hands of a body not only alien to the dental profession, but in many respects disposed to treat it with but little consideration or regard. During a discussion some time ago, when those portions of the curriculum that trench a little upon medicine were under discussion, one of the members of the General Medical Council arose and querulously asked, "What is this qualification you are talking about, is it a surgical qualification?" "Oh, no," the spokesman for the dental profession replied, "this is not surgery, it is dentistry, pure and simple, tooth-pulling and the like." In this same body, when these matters have been under discussion, as they have been from time to time during the last four or five years, the dental profession has been repeatedly spoken of, offensively, as a "mongrel" profession. At the session during which the new curriculum was settled, May of last year, the profession had for the first time a representative in the person of Mr. Charles S. Tomes, and it was well it had. The querulous disposition was markedly manifest.

Objection was made to the term "surgeon dentist," it was complained that a surgeon dentist was a surgeon practising dentistry, and wherever it occurred it was ordered changed to "dental practitioner." Continually the fear was expressed that by extending the dental curriculum beyond the "tooth-pulling and the like," the holder of a dental diploma would be encouraged, if his dental business was slow, to call himself a doctor, and go in for general medicine on the strength of his dental qualification. I may have been a little unjust in calling the curriculum adopted a thing of shreds and patches; but how can a systematic dental education be acquired when part of the instruction is taken with medical students in the same classes; where the teachers know nothing of and care nothing for the dental trend which alone makes their instruction valuable to a dental practitioner. Part of this course may be taken, if more convenient to the student, in a science school, part with his preceptor, part in a medical hospital, part in a dental school. They put in a great deal of time, I grant you; but how much of that time is wasted for the want of that systematic grading, blending, and interlocking; that constant care on the part of the teacher, whatever his subject may be, while not lessening by one jot the general instruction he gives, to lay especial stress upon those points which may bear more or less upon the dentist's special work, as is so faithfully done in the American Dental College. When I said that with us the dental profession was a separate and distinct calling, I did not mean that it was divorced from the great healing art, or that it had no relation to medical science; far from it. I wished to emphasize the fact that we had escaped the dilemma which has befallen our English friends. Without let or hinderance we manage our own affairs, teach our students all we think dental students should know without asking any one's permission or consent, and practise our profession as in our judgment we may best serve our clients, unembarrassed by the snarls and sneers of haughty and jealous guardians of effete prerogatives and rights. The General Medical Council of Great Britain is a mixed body. A few members are elected by a direct poll of the registered physicians; a larger number represent the great medical corporations of the kingdom; these are sufficient in numbers to control and to impress upon the council that conservatism of which they are the representatives; and a smaller number are appointed by the Crown. Mr. Tones is a Crown appointment, and holds office for five years nominally; it is, however, practically a life appointment, and on that account esteemed more desirable

and more independent. The dental profession of Great Britain is to be congratulated in having such a well-qualified representative so firmly installed.

I am impressed, and strongly so, that those critics of American dental colleges who deplore the fact that American diplomas have been barred out, and infer that this is due to anything that they have done or left undone, are sadly ignorant of the real facts in the case. When the dental profession in England, after a long and serious struggle, reached a position to assert itself, their first thought was to look after their long-neglected schools. Their best men sought the American dental colleges, and the feeling was very general that there only could a really good, practical dental education be obtained. It was not a large number that came over, compared with the number that annually joined the ranks; indeed, they were few. But the feeling was abroad that the home schools did not amount to much, and therefore a large majority of those who had not the means or the ambition to take an ocean trip rested satisfied with the instruction their preceptors were able to impart. Now, after a time, the profession in Great Britain reached a point in their upward progress when it became absolutely essential that this feeling should be changed; that the home schools should be built up and made worthy of the trust, confidence, and patronage of the profession, which in turn depended upon them for its own uplifting. Fortunately for the leaders of this movement, on glancing over the field, they discovered that of the many American dental colleges two only in their announcements called for a preliminary educational test; so by embodying this requirement in their educational plan they were able with better grace and some little show of cause to curtail this objectionable foreign competition. It was not, however, the competition itself that was the objective point. The main point was to impress upon the profession that their own home schools must be supported; that if they were not up to the mark and worthy of confidence they must make them so. The professional ranks must be recruited by educated men. They could not be so long, as the standard schools were four thousand miles away. It was a wise move, patriotic and just, and has borne excellent fruit. I was very much pleased with what I saw when shown through a dental school during my last visit to London. It was well equipped to do its part.

The barring out of foreign diplomas is not a question of education. It is a question of pounds, shillings, and pence; of dollars

and cents; of franchises and marks; of protection all good governments should extend to its own citizens.

Dr. Kimball.—We are indebted to Dr. Trueman, not only for his paper, but for the interesting discussion that he has contributed to it; and it shows the value of his preparation. His own study has brought out very carefully the points in the discussion as not one of us could have done.

We will now pass to the second paper of the evening, and I will ask Dr. Palmer to read his paper upon "Swiss Pivot Broaches: Their Peculiar Value in preparing Root-Canals."

SWISS PIVOT BROACHES: THEIR PECULIAR VALUE IN PREPARING ROOT-CANALS.

BY JAMES G. PALMER.

These broaches are known to the majority, probably to all present, and I do not expect to present anything new. At the same time, I hope to say something that may interest you concerning what I think is their especial and peculiar value in the work of cleansing and preparing root-canals.

My preceptor, Rancil M. Streeter, was an adept in their use; and I have him to thank for what I know of how to select and use them.

They are made for jewellers' use in enlarging or reaming the fine holes in brass, for clock and watch work, and are found *hard-tempered*,—so hard that they break readily when slightly bent. (Example.)

If heated too rapidly, they will burn quickly. (Example.)

They are not round, but usually *five-sided*. Those which I will show you to-night are *five-sided*, and these sides or edges are sharp.

There are several sizes, and I believe several qualities. What I will show you to-night are No. 2. The difference between Nos. 2 and 3, for instance, is slight; but between Nos. 1 and 3 considerable.

They are usually obtained in gross packages, from any dealer in jewellers' findings. There are a number of such establishments in Maiden Lane, Nassau and William Streets. Better assortments and better grades are found at such places than where all kinds of tools for mechanics are kept.

When the temper is entirely drawn and the broach rendered

soft, it is very pliable, and can be tied in a knot without breaking. (Example.)

This quality enables them to follow a winding, tortuous canal with but little if any danger of breaking.

Not being round, and the angles or edges being well defined, they are good reamers, even when rendered soft, and work especially well where sulphuric acid has been introduced.

If drawing the temper entirely renders them too soft for such work in the estimation of the operator, the temper may be drawn over an alcohol lamp to suit. A spring temper can thus be obtained similar to piano-wire, or better. Much care, however, must be exercised, else the broach will be burned, as I have shown.

In a gross package one will find at least three different shapes. For the jeweller this does not make any difference, but it does to the dentist. All can be utilized; but for fine, delicate work in a root canal only one kind is desired,—that which tapers *gradually*. Perhaps half the package will consist of this kind, tapering *gradually* from the handle to the point and having sufficient thickness in the beginning of the taper to stand the strain of pushing and twisting or reaming. The other half of the package will consist of those which are light or slender all the way from the point to the handle, and of those which, while tapering well, are blunt at the point and will not go into a fine canal. Those which are too light or slender, after being made soft, will double upon themselves on slight pressure, while the thicker, blunt ones will not go more than one-third of the way into the canal.

As I have said, the temper may be drawn over an alcohol lamp to suit the operator, but to render them soft and pliable, like those which I shall show you, I have succeeded best in the following manner: Put a layer of fine asbestos fibre on a piece of sheet-iron or any convenient metal-holder; lay the broaches on this, spread out so as to avoid much contact. Then place another layer of fine asbestos over them, and, if you choose, another plate of sheet-iron over all. Place this all over a large gas-burner, or any convenient heating apparatus, and heat for an hour or more. Allow the asbestos to become *entirely* cool, and the broaches will be found uniformly soft. I find asbestos sold by H. W. Johns, 100 William Street, known as “No. 305 Fibre,” to be cleaner and better for this purpose than anything I have come across.

The especial value to me of these broaches has been in cleansing and, when necessary, enlarging root-canals. I have alluded to their

use for enlarging when sulphuric acid has been used. One can readily make a passage under apparently difficult circumstances, to my mind, with far less likelihood of serious results than in endeavoring to drill the canal with the engine.

In cleansing a putrid canal they are of inestimable value, because by reason of not being round, but having four and five sides, a whisp of cotton or floss silk can be wound around without slipping off, as it so frequently does from a round broach. With one of these fine, delicate broaches and just a strand of floss silk, barely perceptible, wound around it, one can go nearly to the end of the finer canals, and by frequent using of fresh silk wipe the canal as dry as one chooses. Having a number wound at one time facilitates the operation.

In the same way medicaments can readily be carried to the end of the canal, and when it is desired, by having the cotton or silk a little larger and wound tightly, the broach so wound becomes a fine piston, and will force the medicine used entirely through the foramen if desired.

A little practice in the art of winding the cotton or silk will enable one to so wind a broach that the point will be covered and protected, and will not lacerate by slipping through the silk and beyond the foramen.

In the same way they make excellent instruments to carry whatever material one may wish to fill the root with to its place. If one desires even to fill a root with gold they are valuable then, for soft foil can nicely be wound around the broach, making as long or as short a delicate cylinder as desired. This can be introduced into the canal to whatever point the operator desires, and another broach can be passed into the canal until it presses upon and against the one with the gold wound on it. Holding the second broach firmly, the first is withdrawn, and the cylinder is in place. This can be repeated until the canal is full. Do not misunderstand me. I am not advising this as a method of root-filling. It is *one* way in which it can be done.

I said the use of these broaches was not new to the dentist. Sixteen or seventeen years ago, at an afternoon and evening meeting of the Central Dental Association of New Jersey, assisted by Dr. S. C. G. Watkins, of Montclair, I gave a clinic and short description of their use.

Dr. S. G. Perry, of this city, has also written about them, and there may be others.

Notwithstanding this, I have frequently heard brother dentists express surprise when the use of a smooth broach was spoken of, and trust what I have said may be of some help. They do not take the place of the barbed broach, but are valuable adjuncts.

I have prepared a quantity, full soft, and will pass them around. These are out of a gross package recently purchased at Keller's, 64 William Street. I have assorted them so as to have the three kinds usually found in such a package separate. I have also wound some with floss silk and some with cotton for your inspection. I also show you a sample of the asbestos used. There is one lot from the original package. You are at liberty to test these,—break them, twist them, or do what you please.

Dr. Kimball.—We are very glad to hear what Dr. Palmer has had to say about the broaches, and shall be glad to have other points about them.

Speaking about winding broaches with cotton or silk reminds me of a little point I once received from Dr. Albert L. Buck for winding a perfectly smooth surface in making a little swab for the nose or throat. The secret is to pull the little threads of the silk or cotton apart, and wind the extreme fibres as tightly as possible. In a moment it has gotten an anchorage and readily forms a mass.

Dr. Palmer.—That is just the point in winding these broaches, just catching the edge of the floss at the point and beginning the winding there; but catching the floss on the fine small point of one of these Swiss broaches is a much more difficult matter than on such a broach as Dr. Buck uses.

For a long time all the barbed broaches we had were made from these pivot broaches, but there was not much care taken in selecting them nor in picking out those that were especially tapering.

Dr. Howe.—In regard to tempering fine broaches, I would like to call attention to the method invented or devised by Dr. Meriam, who has tempered needles and other fine instruments in glass test-tubes. I have never known of any way by which delicate instruments could be tempered so successfully.

The description of Dr. Meriam's method was published in connection with a paper on making crowns, in the *INTERNATIONAL DENTAL JOURNAL* for March of this year. I would advise all who are interested to read it and try his method.

These broaches which Dr. Palmer has tempered are wonderfully well treated, but Dr. Meriam's method is much simpler, and is so easily within control that one can carry it to any desired degree. Broaches

or other small instruments may be put in the tube to almost any number, and the temperature raised to whatever degree desired. The change would be shown by the color of the instrument. When the proper color is reached the tube is allowed to cool off slowly.

Dr. Davenport.—I move that we officially thank Dr. Trueman for his paper, which is one that has taken a great deal of time and attention, and one that has sharply defined the differences between English and American methods of educating students and carrying on dental associations. Adopted.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

MASSACHUSETTS DENTAL SOCIETY.

(Continued from Vol. XX., page 322.)

THE SIXTH-YEAR MOLAR.

BY JAMES H. DALY, D.D.S., BOSTON, MASS.

THERE is perhaps nothing with which the dental profession has concern which is of more profound interest and importance than those teeth which are described as the sixth-year molars, or the first permanent molars. There is nothing which so often and so surely leads to misadventure than the lack of information which pervades the people at large concerning these peculiar but important teeth. This lack of information pervades all classes,—the most ignorant and, in other matters, the most learned. Perhaps the most common experience of every member of our profession is the insistence of parents that a refractory sixth-year molar is a "first tooth," and hence that no harm can befall the child from its sacrifice. A "first tooth" the sixth-year molar undoubtedly is, but it is not to be classed with the deciduous teeth, and, in place of the almost universal lack of care for its preservation, let us hope that a complete knowledge of its true character and importance may come to the mass of the people. This accomplished, one of the most potent causes of perplexity in our profession will be eliminated.

It is important that we should impress upon the minds of our patients, especially those who are parents, the fact that these teeth, although they are of early growth, possess many of the qualities

which characterize the deciduous teeth. They are often faulty in structure, imperfectly developed, and liable to be attacked by caries. Often there are small indentations or fissures in the enamel and on the grinding surface, leaving the dentine exposed to decay. Often they are attacked by caries almost immediately after they have erupted, and decay in them is often exceedingly rapid. But, notwithstanding these peculiar characteristics, these molars are the largest teeth in the mouth and have the largest roots, and, if they have escaped the defects noticed, they are often the strongest teeth and of great value.

The sixth-year molar usually makes its appearance at a period of life between the fifth and the seventh year. It has been my experience that these teeth are seen most frequently after the age of five and one-half years. The statement of a writer in "*American System of Dentistry*," that these teeth are often seen shortly after the fourth year, I believe to be erroneous. The eruption at this early age—five and one-half to seven years—causes them to be mistaken for temporary or deciduous teeth, and hence the appearance of decay causes no alarm upon the part of parents, and they are allowed to suffer neglect. The child's first visit to the dentist is more frequently than otherwise occasioned by pain in one of these teeth, which has thus been allowed to decay without attempt at preservation. When this occurs the decision of the parent is almost invariably for a removal of the offending tooth.

Dr. Eugene S. Talbot, in a dissertation entitled "*A Study of the Degeneracy of the Jaws of the Human Race*," says that in England and on the Continent it is thought the proper thing to extract the sixth-year molars as deciduous teeth; and in reply to a letter addressed to a Glasgow dentist, asking for assistance in making examination of the mouths of patients, the latter said, "I am sorry to say that I am unable to procure the measurements you desire, as it is rare, indeed, to find the sixth-year molars in position in persons of twenty-five years of age, especially those of the Scotch people." At times the mischief has so far advanced in these teeth that extraction is inevitable. But the careful and thoughtful practitioner urges that between the seventh and eighth year the extraction of the teeth should, if possible, be avoided. And if this act is performed after the emergence of the twelfth-year molars the result is positively disastrous. Unless the quality and conditions of these teeth is such as to render their preservation impossible, or a positive menace to health, they should be given the benefit of the utmost art of the dentist for

their preservation at least until a period just before the eruption of the twelfth-year molars. If this can be done the second molars will come forward and take the places of those extracted.

"The title of the sixth-year molar to longevity," says Dr. Wedd, "can only be questioned under neglect and abuse. It is the keystone molar: with it the integrity of the arch is preserved; without it the usefulness of the arch is impaired, if not destroyed. Its extraction at an early age signifies a loss of masticating surface that is absolutely detrimental to the health and comfort of the patient. In view of the prominent position it occupies in the arch, and its relation and influence as a just poise or balance in the distribution of the varied strains incident to mastication, its extraction can be considered a physiological mistake."

These molars appear at a period in the life of a child when he requires gentle handling. Their loss often means far more than the loss of an individual tooth, for by this means the entire mouth is often crippled. The grinding surface is frequently greatly impaired, correct occlusion is rendered impossible, and the entire arrangement of the jaw is not infrequently disorganized. The habit of extracting these molars, pursued from generation to generation, will, in the course of time, cause an inherited smallness of jaw. The error of this custom, which prevails too much in this country as well as in Europe, is apparent to the thoughtful practitioner. He cannot fail to observe that, when these teeth are removed at a point of time when the arrival of the second molars will not effect a partial substitution, the effort of nature to bridge the space thus formed often produces a condition lifelong in its discomfort and inefficiency.

Is it possible, then, that these valuable teeth can be preserved and the unity of the oral arch maintained? Difficulties obviously intervene, but difficulties which are not insurmountable. The first of these difficulties is undoubtedly that which has already been considered,—the lack of popular knowledge upon this topic. Could the truth be impressed upon the minds of parents that the molars which appear in the mouth of the child at about the sixth year are designed by nature to be not temporary but permanent teeth, much of the difficulty would be surmounted. This knowledge gained, the parent would not only seek the aid of the dentist upon the first appearance of caries, but would also cheerfully acquiesce in the adoption of any method suggested for the preservation of these teeth. Not only these, but with the possession of knowledge concerning the permanent value of these teeth, parents would not neglect the care

of the diet of their children, to the end that these teeth, in their formative period, will receive such nourishment as may be best suited to growth. "The first molars are developed," says Dr. Marshall, in the *Dental Practitioner*, "at a period when the demand for bone-producing elements in the system is greater in proportion to the supply than at any other, and unless these elements are forthcoming in sufficient quantity the teeth are sure to suffer, since nature supplies first those parts which are of more vital necessity,—the bones of the skeleton. We as a people are proud to eliminate from our food products those parts in which are stored, in greatest quantities, the elements so necessary in the formation of good enamel and dentine. Children should be encouraged to eat such food as contains the bone-producing elements in the best proportions, and in the best form for ready assimilation, prepared in such a manner as to require thorough mastication."

Such increased intelligence and co-operation on the part of parents being gained, the problem of the preservation of the first permanent molars is more than half solved. When, however, the patient is brought, and evidence of more or less advanced decay in these teeth is apparent, *the work of the operator* is before him. Having first persuaded the parent of the necessity for the preservation of the affected teeth, the best method for the case in hand should be applied. It is no part of the plan of this paper to instruct in methods. It may be suggested, however, that such teeth, if not too far gone by decay, may be preserved by temporary stopping. Further than this the judgment of the operator in each case must be exercised. Extraction should be resorted to only when it becomes improbable that, at eleven years of age, these teeth will survive for any considerable length of time. When the pulp is devitalized, before proper formation of the root structure, when a protrusion of either arch or other irregularity or false occlusion may be corrected by removal, then only is it proper to apply the forceps.

The thought to be enforced chiefly by this paper is that of the urgent necessity for a diffusion of common knowledge upon this important point. The suggestion seems not inapt that to this end concerted action should be taken by dental societies, in what may be properly called a "campaign of education." The publication of a pamphlet for distribution among the schools and for general distribution in the homes—a pamphlet which would not bear the external aspect of an advertisement—might perhaps accomplish much in the attainment of this much-desired end.

DISCUSSION OF DR. DALY'S PAPER.

President Draper.—This subject seems to recur periodically, and it is one that seems will never be settled. In the *Dental Cosmos* I notice a letter from Dr. Mitchell, of London, advocating the removal of the sixth-year molars in many cases. The paper is now open for discussion, and it is to be hoped we will hear from both sides of the question.

Dr. William O. Barrett (Ware, Mass.).—Children of about eight years come to my office with the sixth-year molars in such a wretched condition that it seems absolutely necessary to extract them. And still the extracting of these molars is exceedingly unfortunate when the temporary molars have been lost, as it leaves the little patient with only the front teeth to masticate its food until the bicusps take their occluding positions.

I have a case in my own family where the early extraction of the sixth-year molars has caused the twelfth-year molars to tip forward, and so badly expose the pericementum on the posterior surface. The wisdom-teeth crowd upon these exposed parts of the root and invite caries right at the neck of the twelfth-year molars. These cavities are not only very inaccessible and sensitive, but even after they are filled the position of the teeth produces such unfavorable hygienic conditions that these fillings are very likely to fail.

The paper emphasizes a valuable point where it speaks of the importance of teaching the care of the teeth in our public schools.

Dr. H. A. Baker (Boston, Mass.).—I have not had the experience or opportunities of a friend of mine, whom I would like to hear speak on this subject. I refer to Dr. Bogue, of New York.

Dr. E. A. Bogue (New York, N. Y.).—I am to have the honor of saying something on this subject indirectly this evening. It is hardly worth while, therefore, to say anything at this time; but I am compelled to express my thanks to Dr. Daly for what he has said and to express my regrets that he was not more emphatic. I can express my feelings by speaking of two cases. A young lady of twelve years of age came to me with no sixth-year molars. The extractions were done by advice of an educated gentleman. I had to put in a plate for that child to eat upon while the twelfth-year molars were being developed. She was ill from inability to masticate.

In the second case, the daughter of a foreign minister, sixteen years of age, the left lower molar was abscessed and so badly de-

cayed that the two roots were separated. The right lower molar was abscessed and the crown half gone, while the left upper molar was nearly half gone and abscessed, and the right one had an exposed pulp.

Now, if any one ever had an excuse for extracting the sixth-year molars, I think I had in that case; but I recalled some sad mistakes I had made in previous years, when by extracting I had done more harm than good, as was developed by the passage of some years.

Fearing the results that were sure to arise from extracting, I treated both of the abscessed lower molars, and when the separated roots were well, I inserted a screw into each root strongly; then covering the exposed gums between the roots with gutta-percha, I put a platinized gold ring around the roots on the left-hand side and filled it with amalgam. The other lower molar on the right was filled with a ring around it, and the upper molars were restored to health and their normal shape by filling with amalgam.

The young lady's health began at once to improve, and she regained her vigor, married, and has now quite a family.

Dr. C. A. Lindstrom (Lynn, Mass.).—I would like to ask Dr. Bogue how long ago this work was done, and how long, or what will be the condition you anticipate in a few years from now, in the case of the second teeth that were filled with amalgam after they were abscessed?

Dr. E. A. Bogue.—This was done about eight years ago.

Dr. C. A. Lindstrom.—What condition did you find them in, if you have seen them lately?

Dr. E. A. Bogue.—I have not seen them lately.

Dr. C. H. Davis (Worcester).—Do you know to what extent the food or other substances may have crowded underneath the crown and caused the roots to loosen?

Dr. E. A. Bogue.—No, I do not.

Dr. C. H. Davis.—I did a similar thing some seven or eight years ago, and put on a gold crown where the two roots were entirely separated and the gums grown over. I crowned each root separately, then put a crown over that, and put on the bridge. This bridge has done remarkable service.

Dr. Edwin E. Davis (Boston, Mass.).—I had a case which bears a little on this paper, where the crown had decayed, leaving the roots separated as mentioned. After treating the roots, I adjusted a gold crown to each root, treating each root as a separate bicuspid root. The bite was extremely short, and brought no extra

strain upon either root. This was very effective, and at last accounts was in good condition.

Dr. G. A. Maxfield.—What was the age of the patient?

Dr. Edwin E. Davis.—At the time of treatment the patient was eight or nine years old.

Dr. W. O. Barrett.—If the sixth-year molar is to be extracted, it should be done between the eighth and ninth years, before the twelfth-year molar is ready to appear.

Dr. J. H. Daily (Boston).—If the sixth-year molar is to be extracted, it should *not* be done between the eighth and ninth years, but *just before* the twelfth-year molar is ready to appear, or at the eleventh year. Over twenty years ago I took a young patient to a well-known practitioner in Boston, and he advised the extraction of the sixth-year molars. I took out four teeth, and injured him for life. Every tooth separated; not a single tooth backed up its neighbor. That poor miserable root which you are obliged to labor over in order to save, and which at times seems almost beyond hope, is worth all the time, labor, and trouble which it is necessary to put into the work; every year that root is saved adds just so much to the appearance and good condition of the other teeth. They will not tip over in later years, and every year that passes makes each individual tooth more independent of its neighbor.

I feel that I have done that young lad an injury I can never undo. Every tooth has taken since then a more or less abnormal appearance. I must question if they ever would have decayed if they had been separated by one another. The tooth that is next its neighbor, supported by its proper neighbor, is very much less likely to decay.

Dr. —.—The extraction of the sixth-year molar surely causes a great deal of trouble, but this is not always the case. I know of a case where three were taken out and one kept. Where the three were taken out everything was all right; where the one was left the bicuspid was broken down.

Dr. E. A. Bogue.—I will present five hundred dollars to any one who will give me, from any source whatever, one single case where the articulation of the tooth is perfect after the loss of one single tooth.

Dr. Geo. A. Maxfield.—Every one of us present realizes the necessity of saving the first molars. The question that troubles most of us is that the patient has not reached that stage of development where he can see the advantage that can be gained by saving

the teeth. We have that experience every week. It is often difficult to control some patients. The cavity is in such shape that we cannot clean it out to relieve the pain, and the next thing is the tooth must come out. Last week a father came in with his child, and demanded that I extract the tooth that I was trying to save. I refused, and have lost that family as a result. I do not like to extract a tooth for a child, but it is a question what is just the right thing to do.

I have seen cases where the first molar has been removed and the second has found its place. I also have seen a good many mouths with all the teeth in, and in these the articulation is not perfect. I would not detract from anything that Dr. Bogue has said, because it is scientifically correct.

Dr. Carl R. Lindstrom.—What can we do with the many cases which come to us in practice where patients are not able either to give the time or to incur the expense of treatment? Now, dentists are not always able to render gratuitous services; they can do so sometimes; but in my practice, and I think it is so with many, what shall we do when these patients come to us and these teeth can be saved? Sometimes we may succeed in bridging over a period of life, but at other times we cannot do so. Now, what is the proper procedure? I have seen in my own practice many mouths where the sixth-year molars have been extracted, and which were in good condition. It seems to me, although I recognize the truth of what Dr. Bogue says, that we must recognize the truth on the other side. Dr. Maxfield sent his patient away simply to have him go to some one else. If that patient could not afford proper treatment, and Dr. Maxfield could not afford to take him for a charity patient, somebody else had to extract that tooth. Now, I would like to hear from the other side what should be done in such cases.

Dr. N. Morgan (Springfield).—I wish we could have our old friend Dr. Riggs with us for a few moments to give us his experience in this branch. I have had failures in results of removing these teeth, and also many which I esteemed successful. There are many things to consider in these cases. The treating of badly broken down sixth-year molars for children seven to fourteen years of age is a serious matter. In children of well-to-do parents there is frequently a lack of vital force in their constitutions, which makes these difficult operations almost impossible. The children of the poorer class are more inured to hardships and will endure the

operations better ; but the expense cannot well be afforded, and we do not care for too many charity patients. It seems to me that each case must have individual study and the treatment such as is possible with the child, and as far as may be for its future welfare and within the parents' means.

Dr. R. H. Clark.—Accepting the fact that these teeth should be saved wherever it is advisable, there is one question that I should like to have answered to my satisfaction by those who have had more experience in root-canal fillings than I have. Some children have roots developed quicker than others, some children of eight years have roots developed, and others have not ; but with a child who has a permanent tooth that needs attention and is willing to have attention given it, and we find upon close examination that the root is not thoroughly developed, what kind of root filling are we going to place into that tooth ? Some root fillings are irritating and cause a bad effect. What is the best filling in such cases as these ?

Dr. C. H. Davis (Worcester, Mass.). In this line I have had quite a little experience, and very much to my sorrow it has been with my own child. When I was six years old I came in contact with a horse's foot ; I had my jaw broken and my nose broken, and lost some of my second teeth. I have them in a bottle in my office, and they have been a great source of instruction and very useful in demonstrating that certain kinds of work could not be done upon children's teeth. I had a young girl come to me with quite a prominent upper jaw. She had fallen on the sidewalk at ten years old and had broken both her central incisors. I advised putting some porcelain tips on both of them, the parents were willing that this should be done, but wanted to consult with other dentists in the city. This I was agreeable to, and after consultation with some of the prominent practitioners they agreed with me as to how the work should be done, and I did the work. Soon after, the girl's mother came to me and wanted to know why I had not crowned those teeth. Dr. So-and-So said it could be done for fifteen dollars (which was much less than my charge), and look a great deal better than they did with porcelain tips. I said to her, " Do you know the condition your daughter's teeth are in at her age ? " She said, " Why ? " I took out my little bottle with five or six of my teeth in it and showed her the teeth that were broken off (the central incisors), calling her attention to the root development. If I had cut them for pyrexia, as the other dentist would have done, what would I have had to put the crown upon ? I would have had a short stump with a large

hole in it, and nothing to hold the crown firmly. I put those tips on nearly ten years ago, and did some work for the lady last week. Those tips were in good condition.

My boy had his teeth broken off (the central incisors) when he was six and a half years old. He was petting a cow, and as the flies were troublesome she threw her head, striking him with her horn and breaking the teeth. I could not do much for him at that time, but when I came to work into that canal I found it was in the same condition as the one which I have described. I took a little ball of gutta-percha, dipped it in chloroform to soften, measured the length of the canal, and with warm instruments packed carefully the canal. It never gave any trouble whatever. I kept the tooth built down with cement for several years, with a staple in the canal for anchorage. He is now nearly twelve. It has been on five years, and the root is perfectly solid to-day.

Last winter, finding the root firm after being filled some five years, I put a Richmond crown upon it. I was able to do this, as the tooth was but partially erupted, giving me, in addition to the short root, about one-half of the crown of the tooth to hold the pin and band of the Richmond crown, and thus far it has given no trouble.

(To be continued.)

Editorial.

DENTAL EPOCHS IN THE NINETEENTH CENTURY.

THE opening of the last year of the century very naturally and properly leads the mind to the consideration of the influence exerted upon dentistry by the introduction of various things, perhaps small intrinsically, but leading up to great results. It is possible after the lapse of years to judge the effect of certain proceedings, and hence at the close of one hundred years of dental work it is proper to intelligently consider the results in relation to progress in our calling.

It is not difficult to mark certain epochs that have led up to great changes in practice and have made dentistry what it is to-day in America and perhaps in Europe.

When Spooner, of Montreal, Canada, in 1836, gave to dentistry arsenous oxide as a means for the devitalization of the pulp, he could not possibly have conceived of the far-reaching effect that this simple announcement would produce in dental practice. His contemporaries in the profession regarded its introduction as a positive injury, and spurned it to the extent that it required several years to overcome the prejudice of certain leaders in dentistry, and yet the effect of its introduction was not only far reaching, but the good it accomplished has probably no parallel in the use of any other therapeutic agent. Sixty-four years have passed since then, but to-day we are still using this agent, and have not found anything that will take its place with the same degree of certainty in the devitalization of pulps.

When Hudson filled pulp-canals he probably thought nothing of it beyond the fact that it was effectual in producing certain results, and therefore kept it to himself; but Maynard, with a broader mind, perfected this process and gave it freely to the dental profession. Then it was that the value of the Spooner introduction of arsenic became apparent, one naturally leading to the other, for it was the mistaken idea of Harris, and those who thought with him, that it was the arsenic used that led up to violent inflammations rather than the septic conditions of an open canal.

Thus the introduction of arsenous oxide was the first and most important step in the salvation of teeth through the perfect closing of root-canals, by filling, to septic influences, and this must be considered the first and only epoch worthy of note up to this period in the present century.

When Dr. Harris, a year or two later, plead with the faculty of a medical college to establish dental teaching as a branch of medical instruction, he was contemptuously dismissed, and was forced to establish a separate and distinct school. Thus, in 1839, the Baltimore College of Dental Surgery opened its doors, and in that year began a new profession; and to-day, sixty-one years subsequent to this organization, dental education has reached a degree of perfection which Harris could not have conceived in his wildest imaginings. In fact, he died at a period when the few dental colleges were struggling against three almost hopeless conditions,—the prejudice of the dentists of the country, the contempt of the medical profession, and pecuniary embarrassments. In spite of all those and more, dental education grew, and to-day medical colleges and universities are eager to have dental departments connected with them, and medical

men no longer consider it beneath their dignity to take positions as professors in separate dental schools. Truly time has not only confirmed the wisdom of Dr. Harris, but has heaped coals of fire upon the heads of those narrow-minded men who spurned his offer. Even they builded better than they knew, for had his proposition been accepted it is doubtful whether dental education would have reached its present advanced position. The establishment of the first college of dental surgery led not only to an increase of dental schools, but forced the faculties to increased exertions to constantly perfect the quality of work. The idea of colleges as a means for dental training gradually spread to England and the Continent until at the present time schools are springing up in all civilizations. From the organization of colleges have developed the necessity for laws to govern graduation. Thus Dr. Harris's feeble effort has proved far reaching, and becomes, as we scan the century, the most important epoch in the receding years.

In 1854, when Dr. Arthur reported that the cohesive property of gold could be made a valuable aid in filling cavities, neither he nor his colleagues could have anticipated the effect that would be produced in the progress of years. It came to the dentists of the time after many years of the use of non-cohesive gold, and it was, necessarily, coldly received, yet its introduction led up to an entire change of instruments, to the use of the mallet, power mallets, electrical and mechanical, rubber dam, clamps, and a long list of accessories in filling teeth, and finally to the surgical engine of Bonwill. In fact, it may truthfully be said that modern dentistry dates from the period when Arthur brought into practical use the simple and long-known fact that two sheets of gold-foil, fresh from the beater's hands, would cohere without pressure. This, then, must be placed as the third important epoch in dentistry.

The critical mind might object to this classification, for Wells discovered anæsthesia ten years previously,—1844. This is true, but anæsthesia cannot be regarded as marking an important era in dentistry. It belongs more particularly to the realm of surgery. While dentistry glories in the fact that anæsthesia found its birth in its ranks, and Wells and Morton, both dentists, must go down on the pages of history an honor to our profession, it yet remains true that anæsthesia has not been of positive benefit to dental operators. Extraction of teeth is the last resort of dental surgery, and is a discreditable reminder of the limitations of human effort.

The next and most important era is that which began with the

so-called germ theory of disease. The discoveries of Pasteur, Koch, together with the special work of Leber and Rottenstein, Milles and Underwood, Miller, and others, led up to important changes in dental practice. This country can lay no claim to this work, but the results of the study of bacteriology have changed the entire therapeutics of dentistry, in fact it may be said to have changed the curricula of our colleges, leading them nearer to the standard of the higher medical schools. While dentistry has benefited by this discovery, it cannot be said that this is to a greater extent than surgery. Probably Lister had no idea that his suggestions as to antiseptic treatment would lead up to the extraordinary operations of the present time, but his work was therefore none the less valuable. It is the first step that marks progress, all others are comparatively simple and easy of attainment.

Before antiseptics was understood the practice of dental therapeutics was pure empiricism, and is to-day where this is not made a special study. The dentist of the earlier part of the last half of this century had no control of a decomposed pulp. He was thankful if this failed to run rapidly into an abscess, for the knowledge to meet these septic conditions was not at hand. Abscesses were the common inheritance of a race then fast becoming edentulous.

Allusion has been made to the introduction of mallets and various machinery, and these necessarily led to electrical motive force and compressed air. All of these are but the outgrowth of the introduction of cohesive gold, and are therefore not to be regarded as specially influencing the dental mind.

Many things are too recent and too near the close of the century to determine their true value, and among these may be classed cataphoresis. The historian of the future can be better able to give this operation its proper position in practical dentistry. The same may be said of Bonwill's surgical engine. It may mark a decided change in many surgical operations and be only second in importance to anaesthesia, but before that is fully determined, men who essay to work with it must understand the use of tools, and this places its universal adoption a long way in the future.

The analysis of the past and its effect upon dentistry is, it appears to the writer, an important part of dental education. It embraces the value of small things. The crude conception of Spooner made dentistry what it is to-day, and possibly some unknown worker may be evolving ideas that will revolutionize the dentistry of the coming century. Our artistic conception of a filling has been based for a hundred years or more on gold. May not the

ideal filling-material of the coming century be an entirely different material, and lead us up to a more perfect salvation of teeth with greater comfort to our patients and to the reduction of the excessive labor which belongs to the dental profession as now understood?

Entering upon the last year of the century, we may look forward with assured confidence to the future. We have built the foundations well in this country and have spent the hundred years in perfecting the operative and prosthetic portions of our work. Now, in the future more must devote themselves to the scientific side and endeavor to emulate our European brethren in those things that truly make a profession.

Obituary.

DR. BENJAMIN H. CATCHING.

THE death of this prominent dentist was noticed briefly in the December number.

He died November 23, 1899, suddenly, of apoplexy, at his home, and while preparing to leave for his office.

Dr. Catching was born in Georgetown, Mississippi, in 1848, being fifty-one years of age at the time of his death. He moved to Atlanta, Georgia, in 1880, and resided there up to the period of his death.

His work in dentistry is, probably, better known than that of any member of the dental profession South. He was for a number of years editor of the *Southern Dental Journal*, and subsequently established "Catching's Compendium" and the *American Dental Weekly*.

The remarkable character of the man is best illustrated in the issue of the "Compendium." This, as its name indicates, was a condensed statement of dental periodical literature for the year. Few, perhaps, can realize what this meant in exhaustive labor. It probably had much to do in shortening his valuable life. Aside from the work entailed in its preparation, he must have had many hours of anxiety in regard to its success professionally and financially. A quotation from a letter to the writer of March 1, 1894, gives some idea of the laborious task he had set himself yearly to accomplish: "I send to-day a 'Compendium' for 1893. I hope you

will like it. Now that the work on it is about over, I feel completely broken down. No one knows the immense amount of work it requires to get out the book."

At this period—1893—he adopted the suggestion of the writer to extend the scope of the book to cover the work of other nationalities. In the preface of this year's book he announced, "In this issue the condensed practical results of the dental journals of six different nations are given. The next edition will contain the practical results of the dental journals of the world."

The cause of the discontinuance of the "Compendium" is unknown to the writer, but possibly the lack of financial support combined with the exhausting character of the work may have compelled its abandonment.

The *American Dental Weekly* followed, but this lasted but a brief period. The day for weekly dental journals had not then arrived, and probably will not in many generations. It was well edited during the year it lasted, and was always a welcome visitor among our exchanges.

Thus at a comparatively early age one of the brightest men of the South has concluded his work. While his home was at Atlanta, his name was a household word throughout this country and well known abroad. While he loved his native South, he was broad enough to recognize that dentistry knows no clime and no people, but is part of the humanitarian work among all nationalities.

He was deeply interested during the later days of his life in the question of dentists in the army and navy, and probably one of the last, if not the last article from his pen was published in the November number of this journal upon that subject.

The writer enjoyed his friendship for many years, and, while personal association was infrequent, he always felt that he had received a portion of Dr. Catching's enthusiasm whenever that opportunity offered.

The South will miss him, the world will miss him, and the writer will continue to feel that in his death the silent reaper has ingathered one of the true-hearted, whose love for his profession led him to walk, all too early, up to the last and eternal sacrifice.

Dr. Catching leaves a wife and four children,—one son and three daughters.

ACADEMY OF STOMATOLOGY—RESOLUTIONS UPON THE DEATH OF DR. BONWILL.

THE committee on resolutions upon the death of Dr. Bonwill beg leave to submit the following :

WHEREAS, W. G. A. Bonwill, D.D.S., a member of the Academy of Stomatology, has been removed by death, it becomes our mournful pleasure to make record of his worth ; therefore be it

Resolved, As the sense of this society, that in the death of Dr. Bonwill the Academy has lost a distinguished member and the dental profession one of its best-known followers.

As a man Dr. Bonwill was genial and affable, though often misunderstood. As a dentist he was skilful and conscientious. As an inventor he had no superior in the dental profession. As an enthusiastic worker in the field of dental advancement he had few equals.

Entering upon the study of dentistry at an early age and under pecuniary disadvantages, he worked his way to success and eminence by burning zeal and untiring industry. His temperament was such that he could not be idle, and while others slept he was awake and working out problems which have made his name famous throughout the dental world.

As fellow-comrades, marching to the eternal world, we shall miss Dr. Bonwill from our ranks. Let us therefore loiter for a moment on the busy highway of life to hang one garland on his tombstone.

Resolved, That a copy of these resolutions be engrossed upon the records of the Academy and additional copies sent to his family and the dental journals.

EDWIN T. DARBY, *Chairman*,
JAMES TRUMAN,
I. N. BROOMELL,
HARRY B. HICKMAN, *Secretary*,
Committee.

Domestic Correspondence.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

TO THE EDITOR : *

SIR,—It is well known to the members of the dental profession, especially those interested in dental education, that in April, 1899, the Wisconsin State Board of Dental Examiners refused to register diplomas from the Chicago dental colleges and other schools, as the law provides. The provision of the law is that the Board shall at

all times issue a license to any regular graduate of any reputable, legally incorporated dental college, without examination, upon the payment of the registration fee. After making inquiry of the secretary of the Board as to the reason why the diploma of his client was not registered, Attorney Quarles, who had been retained in the case, received the following reply :

MILWAUKEE, April 13, 1898.

"HON. J. V. QUARLES, Milwaukee, Wis. :

"DEAR SIR,—I am authorized to say, from instructions received from a member of the Committee on Colleges of the National Association of Dental Examiners that if the college you represent accepts all the rules as laid down by the National Association of Dental Examiners, in regular form through that body, that this Board will, upon the receipt of such knowledge, issue licenses to regular graduates of said College.

(Signed)

"W. H. CARSON,
"Secretary."

After receiving the above letter, Dr. P. T. Diamond, a graduate of the Chicago College of Dental Surgery brought mandamus proceedings to compel the board to accept his diploma. The Board moved to quash the proceedings, which motion was denied by the court in a vigorous decision handed down by Judge Sutherland, of the Superior Court of Milwaukee County, Wis. Summing up the case, in regard to the standing of the college, the Judge makes use of the following language :

"The relation in this case shows that among intelligent men, whether members of the dental profession or not, the Chicago College of Dental Surgery must be regarded as a reputable institution. . . . Therefore, without difficulty, the Court reaches the conclusion that the motion to quash the mandamus proceedings must be denied."

The action of the Board was based on the ground that those schools refused to subscribe to a rule passed by the National Association of Dental Examiners, regarding the preliminary educational qualification of students.

The National Association of Dental Examiners, of which the Wisconsin Board was a member, at their meeting at Niagara Falls, in August, 1899, rescinded the rule which was the cause of the controversy, and passed a resolution adopting, in substance, the rule governing preliminary educational qualifications of students which was adopted in 1898 by the National Association of Dental Faculties. In adopting this resolution the National Association of Dental Examiners recommended to the various State Boards that all the schools

belonging to the National Association of Dental Faculties be placed on the recognized list, and that the graduates of those schools be licensed, and that all litigation cease. In all States where difficulties had arisen regarding the registration of diplomas of graduates of schools belonging to the National Association of Dental Faculties, the trouble was at once terminated and licenses issued, except in the State of Wisconsin. The representative from the Wisconsin Board pledged himself at Niagara Falls to return home and do all in his power to terminate the litigation. The week following the National Association meeting, the Wisconsin Board, with their attorney, met by appointment the representatives of the Chicago College of Dental Surgery and the plaintiff in the case against the Board with his attorney, and after a conference the representatives of the Board informed the representatives of the college that the members of the Board had voted *unanimously* to continue the litigation.

On August 13, 1899, the following letter was written by Senator J. V. Quarles, attorney for the complainant, to Dr. T. W. Brophy, Dean of the Chicago College of Dental Surgery :

“QUARLES, SPENCE & QUARLES,
Attorneys and Counsellors,
The Sentinel Building.

“MILWAUKEE, WIS., August 13, 1899.

“DR. T. W. BROPHY, No. 126 State Street, Chicago, Ill. :

“DEAR DOCTOR,—As you are aware, a meeting of the State Board of Dental Examiners took place yesterday in this city for the ostensible purpose of carrying out the recommendations of the National Board so explicitly made at its meeting at Niagara Falls. Nothing could be more plain and explicit than the recommendations of such National Association, which ought to be looked upon as a command by members thereof.

“I have to report, however, that our State Board have assumed to be wiser than the national organization, and have positively declined to follow or respect the mandate of the central body. The State Board refuses to recognize the diplomas of your college and all others similarly situated, and leaves no course open but to continue the litigation. We shall, therefore, unless ordered to the contrary, embrace the first opportunity to crowd the case to a final hearing and allow the National Board to deal with its recalcitrant members.

“Very respectfully yours,
(Signed) “QUARLES, SPENCE & QUARLES.”

Preparations were then made for a vigorous prosecution of the case. The Committee on Law of the National Association of Dental Faculties, which was created at the Niagara meeting in August, 1899, for the purpose of taking charge of this litigation, as well as any other litigation involving the Association or any college holding membership therein, held a meeting in Chicago, October 14, 1899,

and after a conference with the members of the Wisconsin State Board, the latter agreed to license graduates of the Chicago colleges and all schools belonging to the National Association of Dental Faculties. November 6 the agreement was consummated. November 7 the following letter was received by the Dean of the Chicago College of Dental Surgery:

"QUARLES, SPENCE & QUARLES,
Attorneys and Counsellors,
The Sentinel Building.

MILWAUKEE, WIS., NOVEMBER 1, 1899.

"DR. T. W. PROPHY, Chicago, Ill.:

"DEAR DOCTOR,—After great tribulation, regarding matters of detail, I am glad to report to you that the Board has finally decided to conform with the provisions of the dental law of Wisconsin, abide by the ruling of the National Association of Dental Examiners, and license Chicago graduates and all other graduates from schools holding membership in the National Association of Dental Faculties, thus admitting that in their action in refusing to license these graduates from April 11 to November 6, 1899, they were in the wrong. Everything, consequently, in the Diamond mandamus case has been brought to a satisfactory conclusion.

"The injustice the Wisconsin State Board of Dental Examiners has done your graduates, yourself, and the many schools involved cannot be easily forgotten, but our success in securing all we contended for is an assistance of the justice of our cause.

"In evidence of our victory, Dr. Diamond's license has been issued, the stipulation to discontinue the case has been signed by both parties, the whole matter is closed up, and the litigation is a thing of the past.

"Yours truly,

"QUARLES, SPENCE & QUARLES."

A. O. HUNT,
W. C. BARRETT,
HENRY W. MORGAN,

*Committee on Law of the National Association of Dental
Faculties.*

November 17, 1899.

Current News.

A BILL FOR THE APPOINTMENT OF DENTAL SURGEONS IN THE ARMY.

THE following bill was presented to the House of Representatives on December 5, 1899:

IN THE HOUSE OF REPRESENTATIVES, DECEMBER 5, 1899.

Mr. Otey introduced the following bill, which was referred to the Committee on Military Affairs and ordered to be printed :

A Bill to provide for the Appointment of Dental Surgeons for Service in the United States Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Surgeon-General of the Army, with the approval of the Secretary of War, be, and he is hereby, authorized to employ and appoint dental surgeons to serve the officers and enlisted men of the regular and volunteer army in the proportion of one dental surgeon to every one thousand of said army. Said dental surgeons shall be employed as contract dental surgeons, under the terms and conditions applicable to army contract surgeons, and shall be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral and professional character, and shall pass a satisfactory professional examination : Provided, That three of the number of dental surgeons to be employed shall be first appointed by the Surgeon-General, with the approval of the Secretary of War, with reference to their fitness for assignment, under the direction of the Surgeon-General, to the special service of conducting the examinations and supervising the operations of the others, and for such special service an extra compensation of sixty dollars a month shall be allowed : Provided further, That dental college graduates now employed in the Hospital Corps, who have been detailed for a period of not less than twelve months to render dental service to the army and who are shown by the reports of their superior officers to have rendered such service satisfactorily, may be appointed contract dental surgeons without examination.

THIRTEENTH INTERNATIONAL MEDICAL CONGRESS.

BALTIMORE, MD., November 1, 1899.

THE American National Committee of the Thirteenth International Medical Congress, to be held in Paris from the 2d to the 9th of August, 1900, in connection with the French Exposition, has been organized as above indicated.

All Doctors of Medicine are entitled to membership in this Congress by making the proper application and paying the sum of five dollars. The Secretary-General in Paris has instructed the American National Committee to receive the applications of American physicians, and for this purpose a blank form is enclosed, upon which is to be written full name and address, degrees, and any position of note held, together with the section of the Congress to which the writer wishes to belong. A visiting-card should also be appended. These forms, with the five dollars, are to be returned to the Secretary of the National Committee. He in turn will send receipt and forward the slips and money to Paris, where they will be registered, and in due course of time a card of admission to the Congress will be mailed to each applicant.

The Committee hopes the American representation in this extremely important Medical Congress may be as large as possible, and they would urge every member of the profession to enter his name for membership, this alone entitling him to receive a digest of the full proceedings of the Congress and the printed report¹ of the Section to which he belongs.

The Sections are as follows :

CLASS I.

BIOLOGICAL SCIENCES.

A. Section of Descriptive and Comparative Anatomy. Secretary, M. Auguste Pettit, 60, rue Saint-André-des-Arts, Paris.

B. Section of Histology and Embryology. Secretaries, MM. Retterer and Loisel, 15, rue de l'Ecole-de-Médecine, Paris.

C. Section of Physiology, and Biological Physics and Chemistry. Secretary, M. Dastre, à la Sorbonne, Paris.

CLASS II.

MEDICAL SCIENCES.

A. Section of General Pathology and Experimental Pathology. Secretaries, M. Charrin, 11, avenue de l'Opéra, Paris; M. Roger, 4, rue Perrault, Paris.

B. Section of Bacteriology and Parasitology. Secretary, M. R. Blanchard, 226, boulevard Saint-Germain, Paris.

¹ Communications respecting the delivery of these reports to members to be addressed to M. Masson, publisher, of the proceedings of the Congress, 125, boulevard St Germain, Paris.

C. Section of Pathological Anatomy. Secretary, M. Letulle, 7, rue de Magdebourg, Paris.

D. Section of Internal Pathology. (General Medicine.) Secretaries, M. Rendu, 28, rue de l'Université, Paris; M. Widal, 155, boulevard Haussmann, Paris.

E. Section of Medicine of Infancy. (Diseases of Children.) Secretary, M. Marfan, 30, rue La Boétie, Paris.

F. Section of Therapeutics, Pharmacology, and Materia Medica. Secretary, M. Gilbert, 27, rue de Rome, Paris.

G. Section of Neurology. Secretary, M. P. Marie, 3, rue Cambacérès, Paris.

H. Section of Psychiatry. Secretary, M. Ant. Ritti, Asile de Charenton, Seine (France).

I. Section of Dermatology and Syphilography. Secretary, M. G. Thibierge, 7, rue de Surènes, Paris.

CLASS III.

SURGICAL SCIENCES.

A. Section of General Surgery. Secretary, M. Walther, 21, boulevard Haussmann, Paris.

B. Section of Surgery of Infancy. Secretaries, M. A. Broca, 5, rue de l'Université, Paris; M. Villemin, 58, rue Notre-Dame-des-Champs, Paris.

C. Section of Urinary Surgery. Secretary, M. Desnos, 31, rue de Rome, Paris.

D. Section of Ophthalmology. Secretary, M. Parent, 26, avenue de l'Opéra, Paris.

E. Section of Laryngology and Rhinology. Secretary, M. Lermoyez, 20 bis, rue La Boétie, Paris.

F. Section of Otology. Secretary, M. Castex, 30, avenue de Messine, Paris.

G. Section of Stomatology. Secretary, M. Ferrier, 39, rue Boissy-d'Anglas, Paris.

CLASS IV.

OBSTETRICS AND GYNÆCOLOGY.

A. Section of Obstetrics. Secretaries, M. A. Bar, 122, rue La Boétie, Paris; M. Champetier de Ribes, 28, rue de l'Université, Paris.

B. Section of Gynecology. Secretary, M. Hartmann, 4, place Malesherbes, Paris.

CLASS V.

PUBLIC MEDICINE.

A. Section of Legal Medicine. Secretary, M. Motet, 161, rue de Charonne, Paris.

B. Section of Military Surgery and Medicine. Secretary, M. Catteau, Ministère de la Guerre, Paris.

Members desiring to present papers will forward the title and a *résumé* before May 1, 1900, to the secretary of the section to which they belong, for each sectional committee reserves to itself the right of drawing up its own working programme. Papers are limited to fifteen minutes.

HENRY BARTON JACOBS,
Secretary American National Committee.

KENTUCKY STATE DENTAL ASSOCIATION.

THE Annual Meeting of the Kentucky State Dental Association will be held in the city of Louisville, on the 15th, 16th, and 17th of May, 1900. We are already assured of the best meeting in the history of the Association. Aside from an attractive programme, the meeting of the National Confederate Association in Louisville at the same time enables us to procure a one cent per mile railroad rate from over the greater portion of the United States. There will be many other attractions to the dentists who attend,—trips to the wonderful Mammoth Cave and to the blue-grass regions of Kentucky.

Ample accommodations at reasonable rates have already been obtained.

For further information, address

F. I. GARDNER, D.D.S.,

Secretary.

213 WEST CHESTNUT STREET, LOUISVILLE, KY.

NEW YORK ODONTOLOGICAL SOCIETY.

THE Thirty-second Anniversary of the above Society will take place at the Academy of Medicine, Tuesday, January 16, 1900, at two and eight P.M.

At the afternoon session, commencing at two o'clock, Dr. Joseph Head, of Philadelphia, will give a clinic,—Inserting a Porcelain Inlay, using an entirely new cement. Immediately after the clinic Dr. Head will read a paper: subject, "Shadow Problems as presented by Porcelain Inlays."

The evening paper, by A. W. Harlan, M.D., D.D.S., of Chicago: subject, "A Review of Recent Literature on the Loose-Tooth or Pyorrhœa Problem."

Executive Committee.—Dr. W. W. Walker, *Chairman*, 58 West Fiftieth Street; Dr. C. B. Nash, Dr. F. T. Van Woert.

SECOND DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

A REGULAR meeting of the Second District Dental Society of the State of New York, at which the First District Dental Society and the Central Dental Association of Northern New Jersey will be present as guests, will be held at "The Argyle," 308 Fulton Street, opposite Johnson Street, Monday evening, January 8, 1900.

Paper: "The Soft Tissues about the Teeth: Their Morphology and Pathology," by Dr. I. Norman Broomell, Philadelphia. The paper will be followed by a series of original lantern slides pertaining to the subject.

The names of the following applicants for membership, having been received and endorsed by the Censors, will be balloted upon: Dr. Frank S. Ketcham, 359 Macon Street; Dr. S. S. Keowen, 949 Bedford Avenue; Dr. Frank Sanbern, 287 Jefferson Avenue; Dr. W. B. Dills, 260 DeKalb Avenue.

F. B. KEPPEY,
Recording Secretary.

62 HANCOCK STREET, BROOKLYN, N. Y.

THE International Dental Journal.

VOL. XXI.

FEBRUARY, 1900.

No. 2.

Original Communications.¹

INTERSTITIAL GINGIVITIS DUE TO AUTOINTOXICATION.

BY EUGENE S. TALEOT, M.D., D.D.S.²

IN my work upon interstitial gingivitis, or so-called pyorrhœa alveolaris, I, of necessity, divided the causes into local and constitutional. Conclusions and treatment were based entirely upon pathology and not upon previous ideas or methods of treatment. Exceptions have been taken to these conclusions and treatment by some of the best men in the profession.

Every one will agree that successfully to treat a disease the cause should be removed. There are many able practitioners who do not believe in the constitutional nature of interstitial gingivitis. A majority of the profession do not believe that constitutional treatment is necessary to successful issue. It is with a view of making this position more clear that the present paper is written.

I propose to direct attention to the constitutional variety of the disease,—interstitial gingivitis of the type due to autointoxication.

Every dentist even in practice but a short time has noticed that alveolar processes and gums recede from the necks of the teeth through the entire dental arch, or, perchance, but one or two teeth

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

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so involved at different localities in the mouth. The alveolar process is hard, and the gums, as a rule, are healthy, although there may be occasionally a low form of gingivitis and exceptionally a discharge of pus about the necks of the teeth. Despite the infrequency of the pus discharged, the condition has been styled "*pyorrhœa alveolaris*." The patients in whom this condition may be observed are often seemingly healthy. The jaws are well developed, and the number of teeth normal, with broad and short crowns well set in the jaw of the type seemingly least prone to decay. The general appearance of the patient suggests robust health. This condition, while not confined to one sex, most frequently occurs in the male. It is not confined to any period of life, but may occur at any time after puberty.

In dealing with the etiology of this disease, the tissues involved and their physiology first require attention, since here is to be often found the explanation of predisposition to pathologic change. Three great factors require attention. In the first place, in the evolution of the face, the jaws have received receding tendencies, antero-posteriorly and laterally. They are much smaller to-day than formerly, and are still decreasing in size. The crowns of the teeth are not so large and the spaces between the roots are gradually diminishing, hence less alveolar process is required. In the second place, it must be remembered that the existence of the alveolar process depends upon the existence of the teeth. When the teeth are lost the processes disappear by absorption. In the third place, senile absorption occurs just as in the bones of the body, but to more marked extent. In the mouth and jaws, therefore, transitory or adventitious structures occur, which are more predisposed to disease than permanent structures. This is why the alveolar process is more subject to changes produced by altered metabolism due to trophic derangement of nutrition than other structures. Hence osteomalacia, or senile absorption, occurs with more rapidity and disastrousness in the alveolar process than in other bones of the body. In other words, a cause which would not influence bone absorption elsewhere would markedly affect the alveolar process.

This process, furthermore, being situated in a cavity which plays an excretory part in an exceedingly moderate degree under normal conditions, would be markedly affected by the strain and influences resultant on excessive strain on other excretory organs. Such a strain would occur from the old condition known as "blood impurity," and for which blood purifiers were taken in the spring ere

the days when vegetable food and fresh meat were accessible to the general population. This condition, which was scientifically referred years ago to "rheums" or "humors" (whence the name rheumatism), is now known as autointoxication. This condition, while manifesting itself under different phases as the so-called gouty or uric acid states or rheumatism, is at the bottom, and, so far as clinical phenomena and treatment are concerned, but one process. Under existing data the position taken by Rhein¹ and others as to the different clinical aspects of autointoxication cannot be maintained. According to recent investigations by Albu, the autointoxications may be divided into the following classes: Autointoxications from the suppression or disturbance of the functions of an organ,—i.e., auto-intoxication of thyroid gland, pancreas, liver, suprarenal capsules, producing myxedema, diabetes, acute yellow atrophy, and Addison's disease; autointoxications which occur from anomalies in general metabolism without definite localization, such as rheumatism, gout, and oxaluria; autointoxications which are caused by the retention of the physiologic products of metabolism in different organs, such as poisoning due to extensive destruction of the skin by burning, carbolic acid poisoning, uremia, and eclampsia; autointoxication due to the over-production of physiologic and pathologic products of the organism, such as ammonemia, acetoneuria, diaceturia, diabetic coma, etc. The most frequent source of this intoxication is the gastro-intestinal tract.

Autointoxication, like all intoxication, comprehends, as W. A. Evans has said:² (1) production of the intoxicant; (2) absorption thereof; (3) reaction thereto. These three are embraced when auto-intoxication is spoken of, which is poisoning of an organism with matter produced by itself. Assimilation or the making of tissue is the passing of the simple into the complex, stability into instability, with the storing of energy. This instability is a necessity of life. Dissimilation, divided into two divisions, death and energy, the last being a modification of death, is the passing of the complex to the simple, the instable to the stable, with the liberation of energy.

In the building-up process the unused portions of the absorbed foods may produce autointoxication. In the breaking-down process the ash can produce autointoxication. So long as these two processes—tissue building and tissue waste—are normal, intoxication can

¹ The value of Rhein's remedies, however, as to the general principle of autointoxication cannot be too much estimated.

² Journal of the American Medical Association, vol. xvii.

only ensue from faulty action of the destroying organs, of which the liver is the chief, or of the eliminating organ, of which the kidney is a type. This constitutes the first group of those due to faulty elimination. It applies to food remnants and to tissue waste, both normal and pathologic.

The second group is due to errors in cell life. It occurs under three sub-types: (1) by some reason food elements are left unused; (2) the ash from food-burning is usually toxic or unusually difficult to absorb; (3) the secretion of the cells is toxic.

While it may be stated, in accordance with the principles just laid down, that, considered from the direct stand-point of the production in the body, there can be no bacteriology of autointoxication, still it must be admitted that autointoxication produces culture mediums in the body which would not otherwise exist, which enhance the virulency of the microbe, and hence increase the toxicity of its ptomaine. Indirectly, therefore, autointoxication must be considered a factor in bacterial action. In dealing with the general question of autointoxication, it should be remembered that when proteids are placed under the action of gastric and pancreatic juice, they are changed into a hemi- and an anti- group. The anti- group is, as J. A. Wesener points out, broken down into antialbumose and a small quantity of antipeptone. This last is a stable body which does not yield to the digestive juices or even to dilute sulphuric and hydrochloric acids. It is absorbed by the small intestine, but does not replace any waste of the used-up proteids of the body. Anti-albumose is changed to serum albumin, and is the one that furnished the body with its proteid food. The albumose, when injected subcutaneously, causes death; the blood fails to coagulate by reason of the fact that the lime-salts are precipitated by this body. If for any reason the epithelium of the intestine fails to perform its functions of changing this body into serum albumin, toxic symptoms will arise.

While uric acid is charged with being the chief factor in autointoxication, its importance has been over-estimated. It is a thermometer of the extent of autointoxication rather than its chief factor. Recent investigations,¹ as J. A. Wesener remarks, show that uric acid represents the metabolism of the nucleins of the body, and is in no way related to the albumins taken in as a food, for these last bodies of this group are very poisonous. The necrosis arises as follows: The leucocytes break down easily because the

¹ Journal of the American Medical Association, vol. xxix.

carbodioxide remains too long in the tissue spaces; the nucleic acid which is liberated in this way attacks the connective tissue, etc., irritates it, and this forms a good basis for destruction of nucleins.

A factor in autointoxication is non-performance of the process of elimination by the various excretory organs. In the urine alone, as Bouchard has shown, there is present each day sufficient toxins in a normal individual to cause death if not excreted. This condition is notoriously increased after prolonged nervous explosions like those of epilepsy or hysteria. This was pointed out thirty years ago by Meynert, who showed that the status epilepticus, or condition of repeated convulsion, was due to the accumulation of a proteid or nitrogenous body in the system. This status epilepticus is preceded by a decreased amount of toxin in the urine and succeeded by an increased amount. The same is true as to the influence of non-elimination from the excretory organs (the bowels, lungs, and oral cavity) as well as the non-exercise of its poison-destroying powers by the liver. The non-elimination factor, moreover, interferes with ordinary digestive functions, and hence increases its own extent. The other factor in autointoxication is the production of toxic products in such quantity as to prevent their destruction by organs like the liver and consequent elimination, since a product to be properly eliminated must be reduced to a chemical type. Among the factors which tend to produce both these elements of elimination is the power exercised over the processes of growth and repair by the nervous system. In part this influence is exerted through the control of blood allowance by the vasomotor nervous system, and in part by the direct control of the nervous system over tissue change, which is known as its trophic function. Both these influences are effected by mental and nerve strain.

As Bichat showed decades ago, sudden emotion may produce marked effects upon the secretion of bile, and occasion jaundice. Cases are far from infrequent where emotions like jealousy may produce a mimicry of gall-stone colic in neuropathic individuals. Murchison, Christison, and Thompson have traced attacks of biliary colic to jealousy. Other liver changes from sudden nervous disturbances, whether of a mental type or not, are not rare. As mental impressions are communicated to the central nervous system purely through mechanical changes in the nerves, such influence must be purely material in operation. As the brain exercises a checking influence on the operations of the liver it is obvious that

these mental influences can produce two effects. First, the mental shock might increase the checking action of the central nervous system on the local ganglia of the liver. Second, the mental shock might destroy the checking action on the liver ganglia, and in consequence the liver ganglia go too fast, resulting in their exhaustion. Either of these two conditions would interfere with a poison-destroying action of the liver, and accumulation of waste product would be the result. What is true of the liver is true of the other organs. This is especially noticeable, as Tuke points out, in regard to the kidneys. The action of mental anxiety or suspense in causing a copious discharge of pale fluid is familiar enough to all, especially to the medical student about to present himself for examination, the amount being in a pretty direct ratio to his fear of being plucked. The frequency of micturition may, however, arise from nervous irritability of the bladder without increase or even with diminished secretion. Still the action of the skin is usually checked, the extremities are cold, and the kidneys have to pump off the extra amount of fluid retained in the circulation. There is not elimination of the substances usually separated from the blood, compared, at least, with the aqueous character of the whole secretion. The odor may be effected by the emotions in man as in animals. Prout is of the opinion that mental anxiety will not only produce non-elimination, but also change in the chemical character as indicated by the odor and otherwise. As Claude Bernard long ago showed, disturbances in the medulla produce a markedly pale excessive urine. These disturbances often arise from intellectual strain or emotional shock. The influence of emotional states on secreting processes, and thereby indirectly upon autointoxication states, is illustrated in the fact long ago pointed out by Tuke, that pleasurable emotions increase the amount of gastric juice secreted, the opposite effects being produced by depressing passions. Beaumont found in a man with a fistulous opening in the stomach that anger or other severe emotions would cause its inner or mucous coat to become morbidly red, dry, and irritable, occasioning at the same time a temporary fit of indigestion.

The influence of fear and anxiety on the bowels is as well marked as that upon the bladder and kidneys. Apart from muscular action, defecation may become urgent or occur involuntarily from various causes; the increased secretion from the intestinal canal, as from fear, and in some cases from the altered character of the secretion itself. While in this respect the influence of fear may

be inconvenient in man, it naturally assists escape in some animals, as the polecat.

The emotions powerfully excite, modify, or altogether suspend, as Tuke has shown, the organic functions. This influence is transmitted not only through the vasomotor nerves, but through nerves in close relation to nutrition and secretion. As when the excitement is of peripheral origin, a sensory or afferent nerve excites their function by reflex action, so that when emotion arises it may excite the central nuclei of such afferent nerve and this stimulus be reflected upon the efferent nerve, or it may act directly through the latter.

The pleasurable emotions tend to excite the processes of nutrition, hence the excitement of certain feelings may, if definitely directed, restore healthy action to an affected part.

Violent emotions modify nutrition. Various forms of disease originating in perverted or defective nutrition may be caused primarily by emotional disturbance.

As respects secretion, the emotions, by causing a larger amount of blood to be transmitted to a gland, increase sensibility and warmth, and stimulate its function or directly excite the process by their influence on nerves supplying the glands. Painful emotions may modify the quality (*i.e.*, the relative proportion of the constituents) of the secretions.

Emotions check secretions either by extreme acceleration of blood through a gland by unduly lessening its afflux or by direct influence upon the gland. Although, as a rule, the activity of those glands which bear special relation to an emotion is in a direct ratio to its force, the secretion is checked when the emotion is excessive.

The pleasurable emotions tend to act only in one direction, that of increased activity of the secretions. The painful emotions act both in stimulating and arresting secretion. Thus grief excites the lachrymal and rage the salivary glands. Excess of grief checks the lachrymal and fear the salivary glands, while anxiety suspends the gastric. Extreme fear induces perspiration; fear causing less vascularity and secretion, the secretion of milk is lessened by it. The temperature of the skin is lowered and its secretion checked, although cold sweats may occur. Salivary secretion is arrested, while intestinal secretion is often increased.

The main immediate causes of autointoxication, aside from the factor which sets them in action or predisposes, are, according to Pocheore, diminished alkalinity of the blood, due to acidity of the

tissues from over-exertion and other causes. Insufficient supply of oxygen, abnormal fermentation process in the intestines, poison from without by bacterial or other agencies, retention of metabolic processes, evidences of these conditions, may often be detected in the urine. The resisting power of the organism depends very largely upon the manner in which the internal or tissue respiration is carried on.

The four great sewers which eliminate the waste products of the body are the kidneys, the skin, the lungs, and the bowels. Shut off one of these floodgates, and not only the others but even secretory organs must do the work of the one disabled.

One of the greatest eliminators of effete matter is the skin. If from any cause the skin becomes diseased, or after or during eruptive fevers in children, trophic changes and autointoxication are very marked. Pits and grooves upon the teeth, loss of hair, and nail diseases are familiar to every practitioner. Fortunately, these diseases have little or no permanent effect upon the gums, because they are yet in the constructive stages. It is only after one has obtained his growth that autointoxication from the skin lesion, or, indeed, from any cause, makes a grave and marked impression upon the alveolar process. This is peculiarly noticeable in animals. When the other excretory organs are acting badly, the skin and mouth assume their functions. Under massage the skin of the self-poisoned patients has a fecal odor, even when the bowels and kidneys are acting apparently well.

Autointoxication due to imperfect elimination of effete matter from the lungs is a fruitful source of interstitial gingivitis. The more marked forms are those of tuberculosis, in which there is great debility and in which there is greater waste than repair. Self-poison is continually going on and will continue until death. The chest capacity for the inhalation of pure air is almost *nil*, hence the blood is improperly oxygenated and it soon ceases to convey nutriment to the tissues. Eighty per cent. of criminals who die of tuberculosis in prisons have undeveloped chest walls. The degeneracy, therefore, cuts quite a figure in the *rôle* of autointoxication. Degenerates with contracted chest walls are, however, more frequently found. Many undeveloped individuals in every walk of life have tuberculosis. People with undeveloped chest walls and chest capacity may not have tuberculosis and yet suffer from autointoxication. Those who have had pneumonia with adhesion, and who are thus unable to oxygenate the blood, are subject to this disease.

Asthmatics and hay-fever patients suffer from autointoxication and alveolar absorption. When the skin is overstrained, as to excretion through kidney and bowel overstrain, the lungs are forced to take on increased work with imperfect oxygenation as a result. This is noticed in the odor of the breath in Bright's disease. In nerve-strain states, and in the conditions described by Albu, not only do the excretory organs suffer, but the secretions, like those of the salivary and other buccal glands, are so altered as to become irritantia. These excretory conditions result not only upon autointoxication states, but are modified trophic nerve function alteration.

By trophic changes is meant such tissue alterations as occur in morbid conditions from disordered function of the centres controlling nutrition. There may be peripheral as well as central tissues involved. The well-known law of Wallerian degeneration of nerve-fibres is an illustration: the posterior spinal ganglion acting as a trophic centre for the fibres of the posterior root is in the cord itself. The trophic action may be therefore peripheral, though, as a rule, in extensive changes central (cerebral or spinal) origin should be looked for.

The more marked instances of trophic disturbances are the wasting of limbs in the spinal paralysis of children or adults, and the most striking are perhaps the cases of progressive muscular atrophy of the various types and the peculiar hemiatrophy or hypertrophy of the face and other parts. Besides atrophy or hypertrophy there are included under this head other changes in structure or growth, such as the necrosis of some "bedsores," those of the hair or nails, etc. These often indicate a general systemic disturbance, but may be more or less local in their origin likewise. In the case of the bedsores the condition is a necrosis due to the mildest kind of traumatism, a simple pressure acting on tissues, the nutrition of which is in a thoroughly depraved condition, and which consequently break down under the slightest provocation. The direct cause is external, but the primary condition is a general one, starting from the great centres, controlling growth and repair of the system.

Trophic changes are not always destructive; they may be the reverse, as already indicated. A general tendency to take on fat may be considered in a wider sense of term to be a trophic affection, but the term is usually limited to the more or less atrophies or hypertrophies,¹ the changes in structure, pigmentation, etc., which

¹ Evolution by Atrophy, Deane, 1878.

follow certain nervous conditions and are spoken of as being under the influence of a special class of nerves, the trophic nerves, which are supposed to govern nutrition. These are known physiologically rather than anatomically; they have not been isolated, and their independent existence is still somewhat in question.

A trophic change allied to that of interstitial gingivitis is the change which takes place in the skin at the finger-tips in the fall of the year. Through the hot weather the effete matter has been carried off through the perspiration, when cool weather returns the skin ceases to act, and the liver, kidneys, and bowels must do the work of the skin. Autointoxication results, nutrition is cut off, and the skin of the fingers peels off, leaving the basement membrane layers exposed and tender. The exfoliation of the skin continues until the system has adjusted itself to the new order of things.

As I have elsewhere pointed out, the great neuroses, like locomotor ataxia and paretic dementia, afford instances of trophic disorders directly underlying this factor in interstitial gingivitis. This was lately brought anew to the profession by M. Raoul Beaudet, under the name of "mal perforant buccal" ("Thesis of Paris," 1898). This malady, of an evolution more or less rapid, is essentially marked by the shaking and falling out of the teeth, by alveolar resorption, and gingival ulceration, by the perforation, and at times necrosis of the maxillary. M. Beaudet reports seven cases of perforation, three of which came under his personal knowledge. Since then M. Letulle has published (*Presse Médicale* of April 2, 1898) a new case. Dr. Chagnon reports the following case:¹

O. G. is forty-four years of age. About ten years ago he contracted syphilis, for which he was treated more or less regularly. Two years later he got married and had healthy children. He did not abuse himself by the use of alcoholic liquors. In June, 1895, he was admitted to St. Jean de Dieu Asylum, suffering from intense maniacal excitement. At the end of two months the excitement disappeared and the physical and psychical symptoms of paretic dementia, until then hidden by his state of excitement, commenced clearly to show themselves,—embarrassment of speech, fibrillar twitchings of the tongue, ideas of greatness and wealth, and, to crown all, a state of dementia.

The disease followed its course without any remarkable incidents until near September, 1897. At this date my attention was called

¹ The American Journal of Insanity, October, 1899.



FIG. 2.—Interstitial gingivitis resulting in osteomalacia, due to antidiarrhoeum. Old dog. *A*, alveolar process; *B*, large spaces arising from absorption of trabeculae starting in the Haversian canals; *C*, perforating canal absorption; *D*, ball-and-socket ossium, or decalcified bone; *E*, arteries originally Haversian canals.



FIG. 1.

to the state of his dental system. On examination the two incisors, the canine, the premolars, and the first molar of the left upper maxillary were found to be very loose and had only to be picked out. All the teeth were absolutely sound. The ulceration following the loss of the teeth, and which affected the surface of the alveoli, did not heal. About the middle of September a sequestrum became detached. As you can see in this, the work of alveolar resorption is not yet much advanced. The palate roof, forming the anterior border of the maxillary sinus, also forms part of the sequestrum, and thus there was a large aperture of communication between the sinus and the buccal cavity. Two months later the ulceration was cicatrized.

Present condition.—In the inferior jaw all the teeth are sound and there are none wanting. The two premolars and the right canine of the upper jaw are decayed, the second and third left molars, as well as the first right molar are loose, but perfectly sound. There exists no alveolar pyorrhœa, neither does any trace of ulceration appear, except a small opening which would not admit the probe.

It was impossible to inquire into his sensibility owing to the profound state of dementia, which rendered him incapable of understanding the questions put to him. His physical condition is yet good; he is only troubled with weakness of the limbs. The rapid evolution of the affection is noticeable: less than two months after the falling out of the teeth the sequestrum became detached. This would explain the rather slow degree of alveolar resorption. The disease continues its course, since the second and third left molars and the first right molar are actually loose.

Many cases of this type could be cited, but this one so represents the clinical phenomena as to make their report a vain repetition.

It will be observed in a general way that disease of any great eliminator of effete matter from the body, the lungs, skin, kidneys, and bowels, or any disease of the body which may interfere with the function of waste and repair, will produce auto-intoxication. Auto-intoxication produces irritation, inflammation, and absorption of the alveolar process. The constitutional variety of interstitial gingivitis is a definite result of trophic and metabolic change in the system. These changes, if not corrected, lead to severe results. These gum disturbances frequently prophesy the future course of auto-intoxication of which they are the initial symptom.

Many illustrations could be produced to demonstrate interstitial

gingivitis due to autointoxication from casts in my possession, representing all diseases, but the following figure is a more forcible illustration than any that could be produced. It is a skull of a monkey, about one year old. He died of tuberculosis. All the temporary teeth except the left central incisor are in place. Absorption of the alveolar process has taken place to such an extent that one tooth (the central incisor) has dropped out. The inferior and superior left cuspids are ready to drop out, and all the other teeth could be removed with the fingers. Fig. 2 is the microscopic specimen of osteomalacia or senile absorption of the jaw of an old dog.

INFLUENCES THAT RETARD EVOLUTION IN DENTAL SCIENCE.¹

BY DR. S. B. PALMER, SYRACUSE, NEW YORK.

MR. PRESIDENT AND MEMBERS OF THE MASSACHUSETTS DENTAL SOCIETY,—I thank you for the honor conferred in your kind invitation to read a paper before this society. I cannot express my gratitude for the confidence manifested in leaving the selection of the subject to the writer. This is entitled “Influences that retard Evolution in Dental Science.”

It is well at the outset to know why this subject has been considered most important, why it is brought out at the present time, and what is the incentive. The most prominent illustration of retarding evolution in dental science, to my mind, has been the discussion and conclusion of the cause of dental caries. History reports the first paper published on this subject as in 1754–1756. Seven or eight writers are mentioned, which comes down to the time Dr. Miller “took hold of the subject.” Since that time Dr. Black and Dr. Williams have united, and apparently have convinced the dental profession that the cause of dental caries is scientifically settled, and any one who ventures to oppose or present other causes are humiliated for presuming to hold out against such talent, learning, and means for demonstration. In financial circles it would be understood as a scientific trust on the etiology of dental caries.

¹ Read before the Massachusetts Dental Society, June 7 and 8, 1899.

For this reason the cause of dental caries has been taken up. One advantage of a hopeful understanding lies in the recent progress made in electrical science. Cataphoresis has done much in that line; dynamos, electric lighting, and electrotherapeutics have also contributed to this knowledge. The telephone and wireless telegraphy come in as adjuncts. Thus the present seems more promising than at any previous time.

The incentive is a paper by J. Leon Williams, L.D.S., D.D.S., F.R.M.S., London, England, read before the New York Odontological Society, January 17, 1899. The title of the paper is "Which shall it be, the Empirical or the Scientific Method?" The paper is scholarly, strong in support of science and strong in denouncing clinical experience or science which is based upon empirical practice. There may be grounds for the criticism that it is a plea for a special phase of science, that he is like an attorney retained on a given case to the exclusion of facts upon the opposite side. Let the reader be the judge. In all the papers which have been written upon either side of the question, no other has so greatly helped to establish the so-called "electrochemical theory" upon a scientific basis as the one mentioned. The paper was published in the *Dental Cosmos*, March, 1899. The reason is obvious. Dr. Williams has written in favor of science, he has brought forward many quotations from eminent men, which, from their aptness, as well as from the recognized authority of the writer, fortify his position. I am glad to say that I shall not conflict with any of the findings of Dr. Miller, Dr. Black, or Dr. Williams, nor have I had occasion or disposition to do so. Their work has been done, as all understand, upon the physical plane where experiments can be made, and the results recorded in tables, and done so scientifically that others following the same conditions may obtain like results.

My studies were commenced, as will be seen, previous to Dr. Miller's discovery of microbes. My attention was called to the organic or vital phase of caries, limiting my study to a period of development of the teeth of patients, from twelve to fourteen years of age. My own belief was given that gold—for reasons better known at present—was not the best filling-material to use. Twenty-odd years ago it was unpopular to teach such practice. It was announced in discussion that it "debased gold, exalted amalgam, and degraded the profession." From that time until now some leading scientists have pronounced it a vague idea. I ask all readers to carefully review the paper in the *Dental Cosmos* and see

if there appears to be any scientific standing-room for any one at variance with the science therein set forth.

Let us now carefully review Dr. Williams's paper and note the fitness of his quotations, which were made in support of science from a physical stand-point, and see how perfectly they fit organic conditions. They, however, show no understanding of any of the *organic* laws. The first quotation I will make answers two points, first, to ask of my audience the reasonable privileges asked by the author of the paper, and secondly, it seems to show that the three gentlemen agree in their work and findings. "If I may be permitted to speak of my own work as frankly as I would of another's, and without any of that affectation of modesty which is so often used as a thin veneer to cover up the coarsest egotism, I should say that it supplemented and carried to completion in certain directions the work of both Dr. Miller and Dr. Black."

"The first thing which becomes necessary in the effort to induce the dental profession in America to take higher scientific ground is to point out that its present position is not scientific or less so than it should be. In entering upon the subject I quote the definition of science, What is science, and what is it to be scientific in spirit? The simplest and most comprehensive definition of the term is, 'a systematized arrangement of natural facts.' Any man who is engaged in observing the facts of nature and arranging a record of those facts with special reference to their related significance is, just to his scientific labors, a scientific man." Again quoting from the paper, "A fortuitous concourse of facts is not science. Clinical observations do not constitute a science. These things bear the same relation to science that a heap of bricks or roughly quarried stones do to a palace. They are merely the raw materials out of which the building is constructed."

All true scientific work is an effort to learn those constant and persistent conditions which underlie all natural phenomena, and which we call natural laws. Our chief object in acquiring this knowledge is, or should be, its application to life. That life is highest which is lived in most complete harmony with the laws of existence. One might paraphrase an aphorism by Swedenborg, and say "that all real science has relation to life." By this it would seem that science relates to the inner life of teeth as well as to their environments. Another quotation will show the importance of studying nature. "In another department of science we have an eminent example of the rich results which follow the

method of accumulating facts direct from nature." It has been stated that Edison has made or has had made and recorded under his instruction more than one hundred thousand original observations from nature. Up to the present time he has probably not been able to make practical use of half of these observations, but he shows that a use for any one of them may be found at any moment. But vast practical adaptations of electricity to human use which he has made, have grown most entirely out of his own first-hand studies of nature. I believe that he has somewhere said that it has cost him almost as much in time to unlearn the errors he had imbibed from books as to accumulate his own original store of facts.

One is reminded by this of that famous saying of Hobbes, "If," he says, "I had read as many books as other men, I should be as ignorant as they are." All great teachers and investigators discourage the use of books as primary sources of knowledge. "Agassiz would have none of them for his pupils." The quotations fit so perfectly the conditions I would have understood, that there is no need of searching for better, if, indeed, such could be found. Hear what Huxley says upon this point: "If the great benefits of scientific training are sought, it is essential that such training should be real; that is, that the mind of the scholar should be brought into direct relation with the facts; that he should not merely be told a thing, but be made to see by the use of his own intellect and ability that the thing is so and not otherwise." In contrasting the book-made man with one who has studied direct from nature, he further says, "Not only is he devoid of all apprehension of scientific conception, not only does he fail to attach any meaning to the words, matter, force, or law in their scientific sense, but worse still, he has no notion of what it is to come into contact with nature or to lay his mind alongside a physical fact and try to conquer it. His whole mind has been given to books and I am hardly exaggerating if I say that they are more real to him than nature. He imagines that all knowledge can be got out of books, and rests upon the authority of some master or other." That expression, "to lay the mind alongside of a physical fact," is to me one of the happiest in the voluminous writings of this great teacher and investigator.

In our review we pass the scoring which was given to college professors and others of high rank and take up "the work of one of our oldest dentists." Though last to be mentioned, one has no occasion to be slighted for non-attention. The writer says: "Of a com-

what different order and demanding more serious consideration are the criticisms passed upon Dr. Black's work in a discussion before the Odontological Society of Pennsylvania, reported in the June number of the INTERNATIONAL DENTAL JOURNAL for the current year (1898). The work of one of our oldest dentists is quoted to say that "the electrical conditions of the teeth are responsible for decay." I was not able to recognize my own language or *ideas* in the quotation from the journal referred to, which reads as follows: "We all recognize that the ideas of the present day have been evolved from the past and, therefore, I thought it might not be amiss to run hastily over the various facts in the experience of the last century and a half regarding the causes of dental caries." Dr. C. N. Peirce commenced with Bourdet and Jourdain in 1754-1756, as before mentioned, and brought the history down to John Tomes. Following John Tomes, "Bridgman, of England, said, 'Decay is due to a chemical electrical action.' He took the ground that the tooth was made subject to the influences of acids by having its electrical conditions disturbed. He was sustained by S. B. Palmer, of Syracuse, who holds the ground to-day that the electrical conditions of the teeth are responsible for decay. He has written several interesting papers in which he says it is impossible to estimate how far this condition changes the character of the dentine, and he maintains that it is an abnormal condition that makes the teeth yield to the influence of the acids of the mouth. This was the condition when Dr. Miller took hold of the subject, etc." The above are the remarks of Dr. Peirce, *his* understanding of the work which had been done by the gentlemen mentioned, given in his own language, not intending to quote the sayings of others, as there is not a quotation mark used in any case. As you read it in the *Dental Cosmos*, one might think the writers had said the things reported, because the quotation marks correctly applied to Dr. Peirce also apply to those of whom he was speaking. The point to be observed is this: Dr. Peirce's remarks were taken as if I had written them. The sentences were analyzed, paraphrased, and logically considered to produce the following: "One can hardly avoid drawing a deep sigh of discouragement in the effort to deal adequately with this sort of thing. It is entitled to a certain amount of respect, and yet it is all so foreign to the scientific spirit and method of working that the situation is much like the old problem put to us in our childhood days, 'If a bushel of wheat sells for a dollar, what will six yards of muslin cost?' There is no relation whatever between one part of

his problem and the other part or parts. He first brings in a hypothetical condition as a premise; he then says that it is impossible to tell what the effects of this condition are. If it is impossible to tell anything about it, of what possible significance can it be? It is an abnormal condition, he says, that makes the teeth yield to the influence of the acids of the mouth. This is to me merely a plain statement of the obvious, and there is considerable evidence that several well-known teachers and college professors who took part in this discussion are in agreement with the wisdom of the teaching."

The above quotations from the INTERNATIONAL DENTAL JOURNAL, and their analysis, which was aimed at my teachings, have no more bearing upon this study than the lengthy interpolation of another's views would have to my own. It is upon the supposition that I oppose Dr. Black. The old school-day problem would apply in this case. On turning the leaves we find this sentence: "The opinions expressed were confessedly founded upon clinical experience," although, evidently not upon the facts observed, but upon their interpretation of facts. And have we not all history before us to show that such interpretation may be made to teach just the opposite of what is true when the observed facts are not interpreted by some exact scientific method or principle? May not this account for the interpretation of Dr. Peirce's remarks teaching just the opposite of what he intended? Further on in the paper we read of the vitality of enamel. "I believe that enamel is living," says another college professor, and he continues, "there are some things we cannot measure with a yard-stick; there are certain things we cannot demonstrate with crucible or test-tube." If this means that there may be certain forces and conditions which science has not yet recognized, I should be among the last to deny such a statement. But, then, what bearing does this have upon our manipulation of material things as we understand them to-day? Is the yard-stick to be discredited as an instrument for measuring material things, and shall we abandon the use of crucible and test-tube in our efforts to find out the qualities and relationship of material things? The above is proof that all the investigations are made upon material things that can be scientifically demonstrated. Those who presume to teach that vitality has any part in dental caries are pronounced "fixed in opinions with obvious inward determinations never to yield a point." A careful reader of the paper under review will observe that the principal force of argument of its writer is

against the empirical method of teaching which is set in opposition to science.

Speaking of hinderances to scientific progress, we quote as follows : "Another enemy of all true scientific progress is your person of authority. He has acquired notoriety in some special field. He is always to the front when a new generalization based upon new facts in his particular field is brought. He sometimes presents an outward show of deference, but he has an obvious inward determination never to yield a point. Observing him, one is constrained to believe that the force of the most evident facts is lost entirely upon those who are firmly intrenched behind old and fixed habits of thought. Long-continued concentration of mind and purpose in a fixed direction undoubtedly, at least, renders the intellect incapable of perceiving the true relations of things revealed." "The best security for fixedness of opinion is," says Bagehot, "that people should be incapable of comprehending what is to be said on the other side." How does this apply to those who think only on subjects that can be "measured with a yard-stick or demonstrated with crucible and test-tube"? The question is asked, "How is it possible to bear any scientific procedure upon hypothetical conditions which are admittedly beyond the reach of science?" We have never proposed to investigate the unknowable or unthinkable. We are simply trying to establish a solid basis of scientific facts upon which we may work intelligently, instead of empirically, as those must work who "*cannot go over the ground and prove their points, but will have their theories and believe them.*"

"I wonder if any of the gentlemen who are so much given to talking about this mysterious, intangible, vital force have ever carefully examined their own opinions about it?" For one, I will give an answer, yes. I have given years of thought to this subject. I have questioned Nature and received her answers. "The mind has been laid alongside of physical facts and conquered." The reward is that this unknowable, mysterious, intangible, vital force is as well understood as though it had been discovered by experiments in the laboratory. Evolution in science is at a standstill when investigators come to think beyond what may be demonstrated by calcium light or be presented by tables of physical experiments. From the repeated reference to the older men in the profession, and the low scientific rating given them, it would seem that time had been wasted in giving them so much notice. If their teachings are *empirical*, they will soon pass away, young men of science may fill their places, and all will be forgotten.

As we proceed with the review this sentence appears: "Truly it seemed that one must be very alert in these days if one is to contribute anything towards the advancement of knowledge in the dental profession and save one's reputation for accurate statement. At the same time it is noticeable that a large part of the opposition to the new views comes from the older men in our profession. They seem to feel that a change of opinion means the nullification of the work of a lifetime." But I regard that as altogether a wrong position. The condemnation comes not in having taught error, which was really not error so long as nothing better was known, but in clinging to that error after it has been shown to be such. I recommend to them this saying of Marcus Aurelius: "If any one can convince me of an error, I shall be very glad to change my opinion, for truth is my business and nobody was ever yet hurt by it. But he that condemns in ignorance and mistake, it is he that receives the mischief." "We would at least wish to see the older men in our profession content to rest with work well done. We would gladly honor them and ask them to accept our full and cordial acknowledgment of the faithful way in which they have marched forward under great difficulties. They have made wonderful progress, although handicapped in many ways and carrying heavy burdens. But must the universe stop with their passing? Must the deluge which ends all, come upon us as they go? Is it not our business also to put the hand of progress forward a little on the dial of time? Why can they not accept the situation gracefully, and frankly admit that they have not exhausted the possibilities of heaven and earth? But whether they will do this or not, Nature smiles upon them serenely, turning the page of her great book to a new problem, calls out the younger class."

As one of the older members referred to, and one who under other circumstances might feel complimented for the generous credit and distinction bestowed above others, he has fixed upon this occasion as the time to file his conclusions in the archives of the Massachusetts Dental Society for the dental professor's perusal, and respectfully dedicates the work to the young men in the profession. It is hardly possible that you will be called upon to carry the burdens of the older men who have watched dental evolution for forty and some for fifty years. As an individual, I have known and been made to feel what it has been, and still is, to stand for my convictions. Early in professional life, when dental literature was rare, and dental societies beyond reach, there was more time for thought and

study of nature. The outcome was a theory which was not in harmony with established practice. The theory was given to the profession, and I was advised to *retract* and save my professional reputation, and if I did not, the consequences were defined. Denial of a scientific standing has been firmly adhered to, and you have just heard the latest. Kind offers for giving up, excuses for teaching errors, and finally a challenge which few would care to accept, and quite probably it was expected that no one could be found to accept, and thus would end a life-work in disgrace to empiricism and triumph to physical science. Here are the conditions in the challenge, "We show you that lactic acid is formed by certain micro-organisms in contact with enamel. We show you many appearances of decaying enamel which are identical with appearances produced by artificial application of lactic acid out of the mouth. And yet you go on talking about the absence of a certain vague, vital force, or certain electrical conditions of the mouth as being responsible for dental caries. We ask you to abandon this position, or come forward and astound the scientific world by your announcement of the discovery of some hitherto unknown principles of chemistry."

I wish it understood that in my own mind there has never been any clash between my views and the findings of Dr. Miller, Dr. Black, and Dr. Williams. What has been claimed by them for their investigations has been granted. Exceptions are taken to limiting all knowledge of the causes of dental caries to physics. As the review has shown, my own work which relates to organic matter and vitality has been rejected by science and classed with empiricism. Therefore, until the dental profession fully recognizes this work as scientific, I will gracefully take my place alongside of editors, college professors, and eminent teachers, and wait until a sufficient number of facts have been obtained from clinical practice to be entitled to a standing upon a scientific platform. One cannot but feel responsible, in a measure, for teaching error, and thereby leading others to a point of humiliation. Science is in evolution and knowledge is gained by thought. The limit to knowledge is bounded by capacity of comprehension.

It has been plainly stated in the paper that investigations have been made upon inorganic matter which will admit of physical demonstrations. On the other hand, this study has been limited to teeth in a state of development, in which state the pulp plays an important part. This condition cannot be marked accurately by years. Upon an average, fifteen years would be considered a low

estimate for the time children's teeth, or those older which have approximate cavities, could be safely filled with gold without liability of recurrent caries. Close observers will recollect the differences between incipient decay under fillings in children's teeth and those of adults. The former are marked by a brown or yellow shade seen through the enamel, which shows extension over all dentine; while in normal teeth the lines of caries are more clearly defined, darker in color, and not so deep, being the result of imperfect manipulation, while spots are seen through the enamel. I wish it understood that in any case imperfect manipulation introduces the conditions which are so ably supported by science in the paper before us, the truth of which I do not question. Let us consider how caries progress as beneath gold fillings unaided by micro-organisms or lactic acid. From the first office of the pulp of a tooth to the finish of the dentine, the dentine is under vital influence. Nature works upon a principle of consonance of potential, perhaps better understood by polarity, which in a tooth or the whole body would be this: The body is covered by the skin; all within belongs to the negative pole, the positive pole being outside, such as sunlight, warmth, thermal changes, etc. Nature builds up the body from within, using lime, alkali, and such elements as are necessary to complete the tooth. As above mentioned, the functions of the pulp are such as to intelligently direct the construction of the tooth.

In normal dentine all that is necessary to arrest decay is to prepare the cavity and fill with gold when conditions are favorable; and here I will add that gold is the best material in use when adapted to favorable conditions. Now let us consider the unfavorable conditions in the teeth of young people; remember that youth is not limited to a definite age. Teeth that commence to decay on approximate surfaces should not be filled with gold as early as those well enamelled which are attacked with caries arising from fissures or imperfect closing of enamel. Some cases are slower in calcification than others; while a non-conducting filling would allow nature to complete her work, a conductor of thermal changes would check the progress, and the result would be that the portion in contact with the metal would become devitalized beneath the filling, even though the enamel should exclude the lactic acid.

At the opening of the Ninth Medical Congress at Washington, in the address of welcome, the speaker mentioned many modern appliances which aid in medicine and surgery, and added, "with all these give Nature a chance." This remark applies to dentistry to-day.

Obtundents, anæsthetics, cataphoresis, the mallet, are all liable to interfere with nature. Nature rejects mineral food generally by taste, and the above agencies are on the same line and too often forced. Nature tolerates the farmer in tempting the appetite, to fatten his pigs, even the stuffing of turkeys for Thanksgiving; but the dentist often manifests causes for rebellion in stuffing hyperdermically, or the forcing of drugs electrically, as well as malleting gold upon vital dentine. It is all upon a line of shooting civilization into the Filipinos, dangerous to vitality.

In speaking of the influences of gold upon sensitive dentine, thermal change has been used instead of electricity. In the evolution of electricity from mineral to animal bodies we use the same terms, and this introduces the most embarrassing feature of this paper. So far as I know, no one has attempted to formulate or even to state this doctrine of the evolution of forces or laws from the mineral plane to the animal plane, and therefore the embarrassment by being driven to speak of what I have said or done. The discovery, if such it may be called, is a scientific cable-line running from the mineral plane up and into the plane of life, through intellect, reason, etc. I say cable because of the many strands therein.

We will first take up matter, force, and law, known upon the lowest plane. This knowledge is gained in the laboratory, where we have all the material forces and laws as a study. Force is the life of matter; that force is electricity. It is brought to bear upon atoms, and they combine in definite proportions, which is a manifestation of law. The chemist understands that water is H_2O the world over; for his convenience he crowds nature and gives us H_2O_2 , and at the first opportunity the imprisoned oxygen escapes. Upon this plane, by direction of this life-force, crystals appear, each after its kind. Beauty and variety can be seen in frost-work, even in a snow-flake or in flowers upon the window-pane. Leaving the first appearance of life to the biologist, we mention that vegetable life is supported by mineral food in the absence of that more easily digested, and by the unfolding forces and aid of vegetation, food for animals is prepared. This is a wonderful change; but, being so common, little thought is given to it, and apparently no thought to evolution of matter, force, and laws, to correspond with vegetable matter. Bear in mind there must be a Creator; that knowledge comes to every soul as it can comprehend nature and nature's laws. There is much that is unknowable to the masses which would have been known if man had been taught to think independently rather than

to depend upon others to think for him. I do not expect that the radical thoughts here expressed will be received at once. I have given them as they have come to me, "by laying the mind alongside of physical facts and striving to conquer them." No doubt unusual opportunities have been offered to aid in studying nature. They have been improved, and the results are now offered for progress in dental science. One must feel that there has been a mistake in denying this study a scientific investigation, and so much labor bestowed upon the physical aspect. This study has not been wholly confined to dentistry, and the following, which does not, I do not offer as established science. There has been a great desire to establish a scientific connection between atoms and intellect, physics and metaphysics. I do not know that the line has ever been distinctly traced, showing Nature's method of communication with man, showing that man works out what Nature has wrought within. In familiar language, "God created man in his own image."

The next problem is, how does Divinity inspire humanity? Turning to our review we read, "I wonder if any of the gentlemen who are so much given to talking about this mysterious, intangible, vital force have ever examined their own opinions about it? The origin of all this so-called vital force, as Tyndall so ably demonstrated more than twenty years ago, is from that great reservoir of inorganic force, the sun." From the time this announcement came to my notice until now, it has been undergoing evolution, and the facts announced by Tyndall at that time show that he is on the same plane with Dr. Miller, Dr. Black, and Dr. Williams: neither go higher than physics. If Tyndall entertained higher views he wisely kept them to himself. The world was not ready to receive them.

First let us analyze the energy which is given out by a beam or sunlight. Physically speaking, the sun imparts to matter according to its condition to receive all the energy known in physics, of which electricity is the most prominent, and it is the one "live wire" which, like Jacob's ladder, reaches from "earth to heaven." I believe that all revelation from the Creator to man is through electricity in its various phases; commencing with physics and observing its evolution as it appears upon the vegetable and animal planes, we call the change evolution. A more correct view would be to credit evolution with raising matter from mineral to animal bodies, and to say that the sun shines alike upon all conditions of matter, and that matter gives expression to the Divine gift, which is life according to

its condition or state to express it. Electricity is the "breath of life" shown in elements, by the order and proportion of crystals, each after its kind; that is, the crystal is the environment of the life which fashioned it. Beauty is also displayed in frost-work.

Vegetable life follows in evolution, minerals are raised up to organic compounds, and in this marvellous change the same laws and forces have undergone evolution to fit the new condition. Life finds material to environ itself. Every seed, bulb, or twig arranges material for a body suited to its needs and purposes, even the same soil or sap being used to accomplish this purpose. A bud grafted into a crab-apple stock would bear a pippin, a sweet or sour apple, according to the life in the bud. Upon the same principle a pulp fashions a tooth in size, form, and color to match a corresponding one. While the pulp derives its life and material from the common stock in the body, it has the designing power in itself. Whatever interferes with its methods is abnormal. At the age of fourteen years teeth that are prone to decay on approximal sides are not sufficiently protected. This is no argument against the lactic acid cause; it is in harmony so far as the physical causes are an influence. But when the vitality and instinct of the pulp are considered new conditions arise. First, nature in the work of organization in vegetable or animal compounds combines elements in various proportions and retains the same until the vital principles are disarranged. To put metal into the dentine of a young tooth, or into dentine which contains organic matter sufficient to render it a conductor of thermal changes, is unnatural. No more lime-salts are deposited at that point so long as the current is reversed or turned back. Gutta-percha, being less conductive, allows calcification to continue and produce a tooth of normal structure. One point is overlooked, and that is heat. In animal bodies normal heat, or the limit of heat, ranges between freezing and 105° . Vegetable life places it between zero and the boiling-point of water, or near this line. It is easy to see that drinks or food when taken into the mouth at a temperature of 150° , in cases of metal fillings, raises the temperature quite above the normal standard. The effects occasionally appear under large gold fillings in bicuspid, which seem perfect and have done good service for several years. If on account of pulp disturbance such fillings are removed, it is found that the lime-salts have been taken back, causing pulp exposure. It has been stated that some conditions arise where the teeth decay less rapidly, where pulp devitalization has been resorted to, the vital action being cut off from the portion

within the enamel. Also by slow abrasion teeth may be ground to the gums, the pulp receding and secondary dentine taking its place; that is, where the irritation has not turned back the current of supply. Still other demonstrations are found where clasps have irritated the neck of the tooth and worn the dentine. Nature, to meet the invasion, produces pulp-stone upon the side most worn. It seems that we have facts enough to establish science upon the vital side of dental caries. I wish to claim one point, that vital teeth decay beneath gold fillings, independent of the causes so ably investigated and pronounced settled from the physical stand-point. When the natural organic construction of dentine is bruised by harsh gold or malleting, or where by heat the pulp functions are disturbed, decomposition sets in. This is seen through the enamel where gold has been inserted in young teeth for a year or less. The fact is, that a gold filling which passes through enamel into dentine in any tooth is, while mastication of food is going on, an electrode, becoming charged with electricity and discharged when the dentine is a conductor. In a tooth of normal structure it is not a conductor. Aside from the heat above 105° there is electricity that passes through the gold, which is not tolerated by nature, in contact with dentine. Lime-salts are dissolved by action of the pulp. Before Dr. Miller announced his discovery I had tried the following experiment, which convinced me that the first principles of dental caries were coexistent with *creation*, and was enrolled in the law that acid dissolves lime-salts. The enamel was polished on opposite sides of a molar and the tooth suspended in water, in which some carbonate of soda had been dissolved to preserve alkalinity. The suspension was from a clamp of insulated wire, the points resting upon the enamel and the other ends were put in circuit with two or three cells of battery. In less than twenty-four hours the positive electrode had commenced a cavity in the enamel, while at the negative pole there was a ring of salts but no mark upon the dentine. Another test for acid was as follows: a piece of litmus-paper wet with saliva was laid upon a platinum plate which was in connection with the battery, and an electrode, forming the other pole, was slowly traced over the paper, showing in red lines or characters that oxygen was associated with acid. Bear in mind that decomposition of water is quite different by the vital process from what it is by the physical.

Having spent considerable time upon the vitality of the pulp, let us consider and further pursue our study of evolution and of

animal electricity as it is manifested in mind. From my first interest in this study until the present time, there were not facts enough known in vital electricity, all combined, to give an intelligent illustration. First, the mind communicates or corresponds with other minds through several of the senses,—by sight, sound, feeling, etc.,—and by writing or printing. In writing, the fingers holding the pen are guided by the mind, the characters are translated by the receiver, and the message becomes knowledge or intelligence to another mind or person. The first electric telegraph worked upon the same principle: the fingers at the key put upon the wire waves of electricity, which were converted into magnetic force, leaving impressions upon a slip of paper. The ear of the operator caught the sound, and paper was discarded, the sounder taking the place of the register. The telephone teaches a more important object-lesson; that is, the voice, the effect of wave-sound, which is thrown into space by vital energy as the wireless telegraph, sends out physical waves. Speaking into the phone causes vibrations in a metal disk which is in consonance with a similar one at the terminus; thus the mind and thought of one person employ the organs of speech, which are vital organs to produce wave-sounds, which are converted into electricity that conveys the intelligence, delivering it to the ear and understanding of one far away. Electricity, as generally understood, is interconvertible into heat, light, chemical affinity, magnetism, etc. It will in time be analyzed, and added to it will be life, intellect, will, thought, and all that belongs to man to know. Man, we are told, has come up through the stone age, has passed the iron age, and now is in the steel age. There is great promise that the near-by century will be an “age of reason,” an age when man will better know himself and know more of life, natural laws, and divinity.

It might naturally be asked what this digression has to do with dental science. It relates to the phase of science which treats of life; it is a part of knowledge which is connected with a certain vague, vital force hitherto unknown, that is called for in the challenge. This writing is not a reserve, an unheard of principle brought in to astonish opposition, but principles which have been promulgated for years past. Dentistry has given to medicine and the world some valuable discoveries; it may yet add to physiology some new discoveries, and the time seems ripe for it.

It may be instructive to some present to know how these new principles have been discovered. That is the evolution of natural laws and forces to meet the conditions of life and organized matter.

First, there was a desire for knowledge of electricity and chemistry in boyhood days. As country district schools afforded no opportunity for such study, all that could be done was to read such books as the times offered. In 1847 I commenced to wear a silver plate,—all temporary plates were then made of silver. It was from the chemical action of that plate upon various kinds of food that the thought came to mind that *taste* was from vital or organic electricity. To commence the study, I constructed two galvanometers differing in sensitiveness, to meet demands. About three years were spent in study, mostly in the laboratory, some in the mouth. This was learned, and the facts were noted, that food, such as taste and habit direct to be masticated in pairs, or at the same time, were positive and negative, or were used with fluids which produced the same effect. All food which was browned, roasted, or broiled greatly increased the deflection of the needle when tested in the mouth or in the laboratory, saliva being used as fluid. Acid fruits, vinegar, etc., also increased the current. As the current seemed to be of the same nature in either case, the instruments were of no avail in testing the vital current which was believed to exist.

The first important discovery was that vital electricity, which was revealed in taste, became electricity proper when in touch with metal or carbon conductors, and its vitality vanished. Blood, on leaving the artery, loses its life principle. I can see no way that this discovery could have been made without the wearing of silver. Gold, vulcanite, and aluminum plates were used, each teaching lessons relating to respective conditions, but not in connection with vital electricity. Silver worn in the mouth is an unstable element. Its potential is changed in masticating food with every touch or change of acid or alkali, sulphur, or chloride of sodium. Thus the plate became a vital electro-chemical galvanometer, and probably it was the only one ever consulted in the interest of science. First the line was distinctly drawn between mineral and vegetable compounds as food, or even mixtures of the same. The study became as interesting as that of the microscope, and as scientific; still it is rejected because it cannot be demonstrated before an audience. One point of information gained was the effect produced on food by roasting of coffee, toasting bread, broiling meats, salting almonds, popcorn, etc. The effect, except the salt, was to add carbon in the right quantity, which is on the right side of nature's line between vegetables and minerals as food. Browning does not disorganize the organic structure in any of the articles of food mentioned; burning does. Nature

detects the difference by taste. Silver increases the action or taste, sometimes not disagreeably so, but more often otherwise. The sulphur in eggs converted the vital taste into a metallic taste, or bordering upon physical electricity. Carbon from burnt food also increased electrical taste.

Any metal or metallic liquid caused the same sensation that one experiences when placing zinc in the mouth with any other metal. The idea that cider or beer tastes more sparkling when drunk from a pewter mug is not fancy, but scientific. The action of the liquid charges the metal with electricity, and when the beer flows over the edge of the mug it becomes electrified and imparts a thrilling sensation to the organ of taste that could not be experienced in the use of porcelain or glass. This knowledge caused the disuse of the galvanometer to test currents of vitality. It would demonstrate the physical current in an experiment correctly, but could not touch taste. Gold gives but one side of the question of vitality. It being negative and not acted upon, it only acts upon food which is positive in some instances. It detects metals in solution of the liquids in canned goods, but not like silver. Coffee and broiled meats, being also negative, produce very little effect. Rolled or swaged aluminum is by far the most natural for a dental plate. It is not often that any food or material is taken into the mouth that changes taste. Cast aluminum that has been alloyed to aid in casting is not free from objection. It may be interesting to relate my experience in wearing such a plate for one night only; that is, under the same conditions. I volunteered for a clinic at a dental convention, and came out all right, with a cast plate so formed as to cap over a molar on either side to increase the bite and prevent elongation of the teeth. The articulation below was upon a bridge on either side, with gold-crown surfaces. The plate was worn through the day all right, except the electrical taste with which I was familiar. On taking a ride in a street-car in the evening I discovered that all the street lights were demoralized, constantly flashing, but irregularly. It was not long before I learned the cause was not at the central station dynamo, but in an intermittent current in my mouth. By closing the jaws gold and aluminum came in contact, and the flash occurred; while the contact remained closed or when open, all was steady. That was the only instance I have known of vital electricity being converted into light. I do not claim that it was, but somehow the shock acted upon the optic nerve to produce the phenomenon described. The burring out of the metal cap and supplying

the cavity with vulcanite corrected the flash light. By opportunities of this kind I became convinced that vital electricity is converted into physical in passing through any metallic or mineral conductor. And still another principle is, all physical currents in use in electrotherapeutics may be regarded as mineral, all regarded for food tolerated to a limited degree and no further.

It is to be regretted that this crisis has been forced upon the profession at this time. To meet the occasion much of a personal nature has been written in explanation that otherwise would not have appeared. The terms offered were to abandon a life-work of thought and study, and thereby acknowledge having taught error; or produce evidence in support of the theory which has been pronounced vague. All differences arise from the conclusions obtained from two distinct studies, one physical the other vital. It is plainly stated in the discussion that life and its relations to matter have not been considered, because it cannot be demonstrated. The work which has occupied my time commences where that which it has supposed to antagonize leaves off. Opportunities, as before stated, have been improved, and the teachings from nature seem as real as though the knowledge had been obtained from physical experiment. To do justice to the discussion quotations were taken from the paper in the *Dental Cosmos*, which are able supporters of science and apply equally well to organic and physical science.

No higher compliment can be paid the writer than to express my feelings towards any and all who have believed they have been working for the advancement of dental science in opposing the electrochemical theory, than by quoting the apt and well-chosen language of the paper reviewed. "I do not wish to see this chosen profession of ours content with a lower level than rightfully belongs to it. I want to see it take its place among the first, and therefore I say come, let us join hands, and let all petty jealousies and small ambitions be shamed into silence in the presence of a noble enthusiasm for real progress, which shall fill each and all of us."

COMPARATIVE ODONTOGRAPHY.

BY A. H. THOMPSON, D.D.S.

MR. PRESIDENT AND MEMBERS OF THE ACADEMY,—It gives me great pleasure to meet you all this evening. I appreciate your presence here, and I want to thank you for the compliment of electing me a member of the Academy, an honor which I esteem very highly, on account of the honorable standing that the Academy has and the valuable papers and discussions which all the profession esteem, and which I assure you are especially appreciated by those who, like myself, reside at a distance. I take great interest in reading the Transactions of the Academy. Many of my old friends are members, and I want to thank them for the honor of giving me the privilege of reading a paper before them to-night. I shall not attempt to instruct, but rather to entertain you, and for that purpose have prepared a few slides, which we will show you on the screen by way of illustrating, in a general way, the subject of Comparative Odontology. Dentists have a great deal to learn from the study of the teeth of the lower animals. These studies have not been used in our teaching in the curriculum of our colleges as much as they ought to be. This should be taught in an impressive way by the study of the teeth of the lower animals, just as the anatomist studies the parts and functions of animals in comparison with the human body; so I think that the teeth of the lower animals should be studied with this in view, for the better understanding of the teeth of man.

Without pretending to give anything comprehensive, I will begin with some of the lower forms in which teeth are first found. It struck me as remarkable that there should be found in an organism so low in the scale of animal life as the sea-urchin, an elaborate dental apparatus called "Aristotle's lantern." It is composed of five parts, which are arranged around a centre, forming a pyramid. There are five distinct alveoli, each one of which contains a tooth, which is quite like the incisors of the rodents,—having an enamel thick on one side and thin on the other; so that with use it is constantly kept on a sharp edge, wearing away more rapidly on one side than on the other. The teeth being in the centre of the

¹ Read before the Academy of Stomatology of Philadelphia, November 28, 1899.

test, they are protruded and retracted by means of the powerful muscles attached to the test on the inside. Being moved with powerful muscles, the teeth are used with a great deal of force for cutting and reducing food and for boring into rocks, and also shells in order to abstract the juices of the animal for food.

In the mollusks, too, we have a remarkable dental structure. Of course, the bivalves have no head or dental apparatus, but the single-shell mollusks have a head and a dental apparatus that are much complicated. The cuttle-fish, among the cephalopods, has a curious beak; but the dental apparatus is arranged on what is called the odontophore, or tongue, which is raised up over a cartilage, in order to throw it against the roof of the mouth; it uncoils itself, and as the teeth are worn new ones are brought into position for the purpose of cutting. In the snail these teeth are sometimes thrown forward and protruded, so that it is able to cut off plants and grass by means of this odontophore. The mollusks are provided with a great variety of teeth, all of which are classified and have particular names. One form is what is called the *troglossa*, which is found in the *conus* and some other of the sea-mollusks, and is of an arrow-shape, with a tube in the centre which contains poison, so that its bite is poisonous. There are a great many varieties of teeth in the various species of snails, but many of them merely have a hardened mass on the odontophore for the purpose of cutting plants. This is a very interesting field, as there is a great deal to be found out among mollusks in regard to their teeth. Some have but two or three teeth in a row, some have a dozen, some have twenty or thirty, some fifty, and some run up into the thousands. It offers special inducements to microscopists.

Coming to the vertebrates, we find a great deal of interest throughout this subkingdom. In the fishes, that class which is the lowest of the vertebrates, there are a great many interesting things to be found. The teeth of the fishes usually present the primitive form, the conical form of teeth, as shown in the pike, in which we have the hinge-teeth, which are pressed down by food passing over them, and then, springing back, seizes the prey and prevents its escape. The bony fishes that have this conical form of teeth are usually ankylosed to the jaw, except those which are attached by an elastic hinge. There are many types of the conical tooth, so that it is hardly necessary to go into details.

The teeth of the wolf-fish are not very sharp, but rounded for the purpose of crushing shells. It belongs to the same order as the

pike. The sharks belong to the cartilaginous fishes, and their teeth are remarkable in that they are not ankylosed to the jaw, but are attached to a fibrous membrane. This fibrous membrane comes up from beneath the jaw and carries the teeth up over the edge of the jaw, where they stand erect. As they pull off or are naturally lost, they are being continually replaced by others on the membrane that comes up from the bottom of the jaw, from what is called the "thecal fold."

Among vertebrates, there are four principal methods of attachment of the teeth,—fibrous membrane, ankylosis, hinge, and socket implantation. The pike type represents two of these, and the shark represents that with the fibrous membrane. This type is found also in the rays, which are closely related to the sharks, as the teeth are brought up in the same way by means of a membrane within the jaw, although the teeth are differently formed, and are used for crushing shell-fish and substances of that sort taken into the mouth. There are a great many varieties of teeth among the rays, and they exhibit many remarkable forms. They are usually formed as a compressed cone which is depressed into a plate. Sometimes there are serrations on the plate, and sometimes there is quite a distinctive point in the centre, and occasionally a point on the side, a sort of triangular form.

Coming to the reptiles, we have some very interesting forms presented. The dental apparatus of the rattlesnake is very remarkable. The poison fang is erected, and is pushed forward by the superior maxillary bone. It lies back in the mucous membrane until the strike is made, and then it is pushed forward and raised. The remarkable form of the poison fang is to be observed in that it is rolled into a tube; the poison is not pushed through the pulp-cavity, but the fang is formed as if a canine tooth were taken and flattened out, and then it is curved over together, so that all the tissues are folded around the canal within,—the pulp, the dentine, and the enamel around the outside of the canal; and then it is covered again with a layer, perhaps, of cementum outside of that. All the tissues being folded in that way form the tube for the ejection of the poison. A remarkable thing in the formation of the poison fang is that the outlet of the poison is not directly on the point, but on the side of the point. From that suggestion came the idea of making the hypodermic needle,—first the point was put on the end, and then it was put on the side like the fang of a serpent, Nature having discovered that advantage before man did.

One of the most remarkable forms of reptiles is that of the turtles, which are without teeth proper, the masticating apparatus consisting of beaks like the bills of birds. Of course, there is some variety,—some are vegetable-eaters, which have the beaks built for crushing; others are carnivorous, and the beaks present a sharp edge for cutting flesh. The turtles are very interesting as showing some difference in the varieties of dental apparatus.

The crocodilia offer some interesting things in the study of the teeth, in that they are conically formed and show the true cone-form of tooth—that of the lowest form of vertebrates from which the mammalia, higher forms, were elaborated by duplication—as modification of the primitive cone. Alligators have these simple, conical teeth, which are implanted or imbedded in sockets. They are an advance on some of the other vertebrates, because in fishes the teeth are attached by ankylosis; in lizards attached either by ankylosis on the sides of the groove or implanted loosely in the groove. In the crocodiles the groove has a septum across between each tooth. We have the beginning of the true sockets in the crocodilia. These teeth are in continuous succession, as in the lower vertebrates; and they are pushed up as new teeth arise from the depths, so that they are developed in the socket of the tooth and carry the old teeth upward. These teeth are quite irregular in many forms. The teeth in the maxillary bones are small, and begin to rise to the large ninth tooth from the front, which is called the canine, but it is not related to the true canine. Then they decrease to smaller forms, then increase to the seventeenth tooth, and then decrease to the last, so there is some little system in the arrangement. There is some difference in the various types of the crocodilia. As between alligators and crocodiles there is little distinction. The alligator of the Mississippi Valley has the long tooth, or canine tooth, closed within the upper jaw in a sort of fossa, which sometimes becomes quite deep. This lower tooth may come up through the snout and project above. The crocodiles, however, have this tooth coming on the outside of the snout, and that marks a distinction between the species, and is one of the main differences. The teeth are almost alike as regards the size, shape, and in other respects.

Related forms are the caiman of South America and the gavail of India. The gavail is remarkable for having a spoon-shaped snout. It is very narrow and elongated, spreading out in a spoon-shaped form and being surrounded on the edges with sharp teeth. These all belong to the one family. One of the most remarkable

discoveries of recent years among fossils is in regard to birds that had teeth,—the *ichthyornis* and *hesperornis*. One is quite a low form, in that the teeth are imbedded or implanted in distinct and continuous grooves, and in the other they are planted in the sockets. The teeth are of a low reptilian form, having a large base or bulbous root, by which they are attached. They are implanted in a ball, as it were, and this is set in the jaws. These forms are interesting as showing the transformation between the birds and reptiles. There are no living birds that have teeth, although sometimes they are found in bird embryos; and the discovery of these tooth-birds is quite remarkable, as showing a connection between the reptiles and the birds. And that takes us back to some of the fossil reptiles, as the fossil flying-lizard or pterodactyl, reptiles having teeth and extended wings, bat-like wings, but yet were distinctly reptilian. Some are quite small, but others had an expansion of twenty-five feet. These were found in fossil formations in the West, and are distinct species. Another beauty was the dinosaur, something like the kangaroo, having great hind-legs and short forelegs. Some of these were large, standing up as high as a giraffe, but being organized a great deal like a kangaroo, with great heavy hind-feet, used in locomotion, and small forefeet. Some of the other forms are remarkable. They are ugly-looking beasts. Some of these forms were very likely herbivorous, being plant-eaters, some were flesh-eaters. There were some other remarkable forms, some having great crests or scales along the vertebral region, probably armed for the purpose of protection against the attacks of other animals.

Coming to the mammals, we find in the lower forms that the lowest mammals present the type of oral armature which is found in the lowest forms of fishes and of reptiles, that is, the horny beak instead of the teeth. This is found in the duck-bill mole of Australia, whose jaws are covered with a horn-like sheath, for the purpose, as in the duck, of straining food through the water. It used to be supposed they had no teeth, but recent specimens show them to have some calcareous teeth in the back part of the mouth. A curious fact is that teeth have been developed, aborted, and then lost, and the horny beak developed on the jaws afterwards, showing that they descended from a form which originally was possessed of true teeth. It is a very interesting form, bearing some resemblance to the duck on the one hand, and the mole on the other.

In the kangaroo, the lower incisors project and close within the upper incisors; so we have formed almost a scissor-like edge at that

point. The remarkable thing about the jaw of the kangaroo is that the halves of the lower jaws are somewhat flexible, and there is quite an edge along the mesial line of the incisors, by which they shear grass from the ground; and in Australia the sheep have starved by thousands on account of the shaving off of the pastures by kangaroos. It is quite unique that the jaw is arranged so that the teeth can be moved against each other by a lateral motion.

Coming now to the higher form of mammals, we notice first the teeth of the carnivora, which are highly specialized and belong to an extreme degree of organization. We have plant-eaters at one end and at the other end the flesh-eaters,—the carnivora and herbivora. The cats proper have the jaws and the teeth arranged so that they can use them for the purpose of cutting and dividing flesh. The jaw of the cat is articulated, so that there is but the vertical motion, for cutting flesh, and the sharp-bladed teeth pass each other with a shear-like motion. There are no tubercular teeth. Mastication is not provided for by any tubercular forms of teeth until we advance towards the herbivorous types, when it is observed that the teeth and jaws again bear a strong relationship to each other. On account of the vertical motion of the jaws in the carnivora, the teeth are developed in the direction of the greatest use, that is, vertically. As we pass from the cats towards the more omnivorous forms, we begin to have tubercular teeth, which indicate a more mixed diet. As we advance to the bear, we have still more tubercular teeth, which are used for a still more omnivorous diet, because the bear and man are a good deal alike in regard to the forms of molars. The tubercular molars are used especially for a mixed diet. In the dog we have more tubercular teeth, and a larger number in the cats, who have but few teeth, most of the molars being aborted. In the dog we have larger molars and increase in the tubercular form of teeth, which indicates a more mixed or omnivorous diet. In the dog it is interesting to observe the changes that take place in regard to their organization. In the pug-dogs many of the teeth are aborted, and those that remain are very much crowded. In the hounds, which have long jaws, the teeth are the full number, and sometimes there are extra molars. There are more molars in the jaws of dogs that have the long jaws. This is interesting in connection with the different types. The upper molar of the opossum is triangular. It is the survival of a very primitive type of molar. The triangular molar is found far back in ancient times and is a primitive form of the upper molar. We sometimes

have reversions to that type in man, in which we observe a triangular molar above, the fourth cusp being sometimes absent. This triangular molar is retained in the opossums and others. In many forms the fourth cusp has been added to give a larger masticating area. In the raccoon we have a wide tubercular form of molar, and in the skunk and in some such forms the molars are carnivorous and insectivorous to a degree. They have molars, also, for grinding purposes. Many interesting things have been discovered among fossil animals. In what is called the great "sabre-tooth" tiger we observe especially the elongated canine tooth which projected far down below the lower jaw and caused a flange-like development of the rim of the lower jaw, as if making a sheath for its projection. This tooth was developed to such an extent that it is a question as to how it could have been used when the mouth was closed, and whether the animal could have seized anything with the canine tooth; so it is supposed it must have been used with the mouth closed. In South America and in the cretaceous beds of the West there have been found specimens in which there was no flange on the lower jaw; we suppose they employed these teeth with the mouth closed, ripping up their prey on the side. In the fossil forms in South America, skulls have been found in which the lower jaws were caught on the canines and the animal starved to death. That would make a limit to the evolution of that form.

Coming to the opposite extreme, from the carnivoræ, we have the plant-eaters which subsist on vegetable matter. The herbivora eat the plants and the carnivora eat the plant-eaters. There are no teeth in the upper jaw in the incisal region, the lower incisors closing against the gums, as in the cow, goat, sheep, and all the ruminants. It is an interesting thing to note how, in the ruminants, the motions of the mandible and the development of the teeth in relation to the motion of the jaw are worked out. That is, we have the extreme lateral movement for the purpose of grinding; and, as a consequence, in response to this lateral movement, the molar teeth were developed laterally and in the direction of the greatest resistance. The teeth of the herbivoræ develop in such a way as to make them most useful in the reduction of their food; for instance, the enamel, dentine, and cementum are arranged so that in wearing, they being of different densities, there is a constantly rough surface presented, which insures a perfect grinding implement. The enamel being hardest stands highest, the dentine next, and the cementum is worn out most, being the softest. The

lateral movement of the jaw is necessary for the purpose of masticating the food, because plants require extensive manipulation. It is interesting, also, to observe that in each of the families of plant-eaters there is a distinct type of molar; for instance, the cow has a distinct form, also the deer family, the giraffe, the camel, the horse, rhinoceros, hippopotamus, and so on. Each of these families has a distinct type of molar pattern which comparative anatomists come to recognize as belonging to it, and it is diagnostic of that family.

In the cow we observe the type of the molar pattern, which is distinctive; there is absence, also, of the incisors in the upper jaw, their place being taken by the gum-pad, which receives the impact of the lower incisors. There are a few anomalous forms among the ruminants, as the musk-deer, in which there are quite long canine teeth, probably for battle purposes, the horns being absent, which is quite unique in this family, these canines projecting down far below the jaws. These are found, also, in a few others of the deer family.

The horse has a distinct molar type which is characteristic of the horse in all branches of the family. We do not quite understand why the ruminants—the cow, deer, etc.—have no incisors above, and the horse, which subsists on the same food, does have them. It is one of the evolutions of Nature that we do not comprehend. The horse is a non-ruminant and has a distinct set of upper incisors, and the ruminants have not. The phylogeny or evolution of the horse has been well worked out. The earliest horse had five toes. Then in later forms reduced to three toes. Then the present singled-toed horse was evolved, whose ancestors have been found in the cretaceous beds of the West. It is one of the triumphs of evolution that the phylogeny of the horse has been completely made out. In all other families there are many missing links, so that we cannot tell definitely as to all the stages of their evolution; but in regard to the horse its history has been worked out wonderfully and thoroughly, because the stages have all been found and the specimens are to be seen. I think these are found mostly to-day in Professor Cope's collection. The advances that have been made and what science can do are wonderful.

There are more rodents to-day than any other living order of mammals. They are distinctly known by their long chisel-like incisors, which grow from the upper and the lower jaws and meet together at the edges. This is a type of teeth which grow from

persistent pulps and grow continuously, so that they need to be worn off in order to compensate for the continuous growth. The enamel is thicker on the outer side than it is on the inside, wearing the end to an edge. There are many kinds of rodents,—as the squirrel, the beaver, the ground hog, rats and mice, prairie dogs, etc. The beaver has very strong incisors for cutting sticks for building their well-known dams. Sometimes, if an accident happens and one of these teeth is broken, the opposing tooth continues to grow, interfering with mastication, causing the death of the animal by growing in a circle, and sometimes penetrating the head. An abscess from an accident may interfere with the growth of the tooth and throw it to one side, causing it to grow without opposition. Sometimes there is an accident to an upper incisor, so that the lower incisor continues to grow and prevents the animal from masticating its food and it dies from starvation, showing that the wearing of the incisor compensates for the continuous growth. In menageries, beavers have to undergo a dental operation sometimes to have the incisors reduced or filed off. They have to be watched in menageries for that purpose.

We come next to the mammoth, the great elephant of the north of Asia and of America, which was the progenitor of the elephants of to-day. The mammoth has been found in the flesh frozen in the ice of North Siberia. A fine specimen is in the Museum of St. Petersburg, the body of which was found frozen in the ice at the mouth of the river Lena, and for years the natives fed their dogs on the flesh thereof. After a time the authorities heard of it, and managed to rescue some of the skin with the hair on, and this is preserved with the skeleton to-day in the same museum. Although the animal is extinct, it was a true elephant, probably the progenitor of many elephants which are also now extinct. The tusks were enormous, extending out as far as twenty feet. These tusks have been found in great quantities in Siberia and the islands and shoals of the Arctic Ocean. Most of the ivory used a hundred years ago came from this great deposit of fossil ivory in Northern Siberia, or was dredged up from the Arctic Ocean, showing that the animals existed in great numbers at an early period. In the mastodon the teeth are somewhat different from those of the elephants proper, in that they have ridges and nipple-like protuberances on the occlusal surface, while the elephants' molars are on a plane. The mastodon differed from the elephant, also, in that he had two small tusks projecting forward from the lower jaw in addition to those of the upper

jaw, which were like the tusks of the elephant, which project from the upper jaw. Another form was that of the *dinotherium*, which had tusks curving down like a sort of pick, with which he dug the plants from the bottom of the rivers for his food, the upper tusks being entirely aborted.

The enamel plates of the molars are bound together by means of cement, the dentine being within and the cementum without. The form of molar has a relationship to the movement of the jaw in mastication. This movement of the jaw we find is anteroposterior, not lateral; so the enamel plates are arranged transversely to the movement of the jaw, so as to resist and catch the food in the process of the mastication.

The method of the eruption of the teeth of the elephant is quite peculiar, in that the teeth succeed each other horizontally, the tooth passing down through the groove, and not vertically, as with most mammals. In the menageries they have considerable difficulty with the teeth of elephants on account of the lack of wear. In their native wilds they pick up a great deal of gravel and sand, that wears the teeth down and keeps them in order for the purposes of mastication; therefore the keepers are obliged to add sand and gravel to their food in order to keep them worn down in the natural way. The tooth of the *mastodon* is the original form from which the other elephant teeth were developed. The *dinotherium* also had molars like the *mastodon*.

We come now to the quadrumana. In the lowest form, the lemur, the lower incisors project horizontally forward and close against or between the incisors above. This type bears little resemblance to the advanced form of the higher types; but in the lemur there are interesting specimens observed. In some forms the incisors are separated, and the lower incisors project horizontally and pass between the upper incisors, so as to form a comb, and on account of that the animal uses its teeth to a considerable extent as a comb for dressing its fur.

In one American monkey, the howler, the large lower jaw is developed and spread out by the exceedingly large larynx of the animal. Its howls can be heard for miles in the South American woods. The neck is enlarged and has an abnormal appearance. The American monkey differs from the European in having three premolars. It has thirty-six teeth instead of thirty-two. The European or Old World monkeys have but two premolars, like man. There are three in the American monkeys. In some forms of the

American monkeys there are thirty-two teeth, the third molars being absent.

The baboon, as all of the Old World monkeys, have the same dental formula as man, having thirty-two teeth,—two premolars and three molars. The baboon is remarkable for the form of the first lower premolar, the crown and side of the root being raised to a cutting-edge, and the long upper canines closing past them, making a very formidable cutting appliance; there are distinct edges on the upper canine and on the lower premolar. The molar teeth are not as well developed, for we have not yet gotten to the oblique ridge found in some of the higher quadrumana.

The orang-outang is one of the higher types of monkey. It has the same dental formula as man, and its teeth resemble the human teeth to a remarkable degree, except in being enlarged,—the canines protruding very much, and the presence of the diastema in front of the canine into which the lower canine closes. There is much prognathism in this animal. It has the receding chin, like the idiot, which is observed sometimes in some of the lower races.

In the gorilla, which is the highest of the apes, we have a still more advanced type,—that is, nearer to the human form in many parts of its organism than any other lower animal. The denture is not quite as pronounced in its human type as that of the chimpanzee, because in the latter the third molar begins to be reduced; but in the gorilla it is functional, and quite as large as the other molars. We have the oblique ridge quite well developed and distinctly typical. The bicuspid is well developed, and the transverse ridge connecting the cusps is very strong.

There is a gradual reduction, of course, from the gorilla up to the man, in the evolution of the molars; the type of the teeth is still there, and there is no mistake about the relationship. In the lower forms we have not got the oblique ridge; but in the gorilla this oblique ridge appears, as in most of the higher apes.

In the fossil skulls found in Europe some years ago the features were of a distinctly low type, and had many distinctive apelike characteristics. There were the prominent superciliary ridges, the pronounced prognathism, the receding forehead, the chin receding (a very distinct apelike feature), as in the receding chin of the chimpanzee or modern monkey.

In the Sky man there is the apelike form, the later prominence of the chin being an indication of the elevation of the race. So in

many of the lower forms we find this receding chin, which is a distinct Simian-like feature. Some of the teeth were of these lower types, showing the full forms of the molars, and also the fifth cusp on the second lower molar, which is an apelike feature.

In prognathous lower races the third molar shows anteriorly to the ramus of the lower jaw. In the European and higher races the third molar is concealed. There is a pushing forward, not only of the anterior part of the jaw, but of the entire jaw,—prognathism of the entire jaw.

The Australian is one of the lowest living races. We have in the second lower molar the fifth cusp, which is a distinct apelike feature; the third molar is quite distinct in form. The chin is somewhat prominent, but not as much so as in some of the higher races.

The Hawaiian is not so low as the Australian, but shows a distinct type. The prognathism and the receding chin are very typical, and the lower molar shows the fifth cusp.

I hope my rapid review of this valuable subject has been interesting to you, and that it will stir up your interest. There is a great deal to be learned from the subject of comparative dental anatomy as a means of illuminating the important science of human odontology, and therefore we contend that it should be much more extensively studied and taught in our colleges than has been heretofore done.

Abstracts and Translations.

GOMPHOSIS, A BARRIER THAT CANNOT BE SWEEPED AWAY.¹

BY B. H. CATCHING, D.D.S., ATLANTA, GA.

It is not the purpose of this paper to throw the least obstacle in the way of dental progress, but to call attention to a barrier to professional progress.

Those who are striving for advancement are so few, comparatively, that the combined efforts are needed to uphold a cause to which the large majority of its followers are indifferent, or are real hindrances.

¹ This paper having been published abroad, it is given here at the request of Dr. Catching, made a short time before his death.—RIMMON.

It may be so with all professions, but it does seem that dentistry has a larger proportion of inactive members than any other.

Is there a reason for this beyond mere indifference? I think there is, but they are not cognizant of it as such. It is a barrier that stands in the way of those who would see that dentistry is placed along with other specialties. It is of this barrier that I wish to speak, and, in so doing, I am not prepared to suggest a remedy, for there is none. It was placed by Infinite law, and the finite cannot change it.

It is an empty sound to hear from all sides that dentistry has made the most wonderful strides of any profession, and that it now ranks with the most learned. The progress, dentally speaking, has been limited, save in a mechanical way. Orally speaking, however, the progress has been rather wonderful.

Proud of this as we are, and as elevating as it is, yet we must revert to dentistry proper, which is the field of the rank and file, to find the barrier to higher attainments; a barrier that will ever exist to prevent the advancement of the dentist to the position of the oculist and aurist.

With the oral surgeon there is no limit or bound to his advancement; there is no barrier. But to the dentist it is, "so far shalt thou go, and no farther."

Having our bacteriologists, histologists, and microscopists is well, and to them much praise is due; through them it will be that true dentistry, *preventive dentistry*, will come in time. But they, with the institutions of learning and with literature, cannot remove the obstruction and rank dentistry with other specialties. They give position before the learned. There is a broad field of usefulness for the dentist, standing, as he does, at the threshold of health; and he covers this field well; nevertheless, he is circumscribed.

With the masses, and to a degree with the classes, gomphosis will hold him to a sphere from which he cannot rise to that position of prominence which is the desire of all who aspire to things higher, better, and nobler.

The classes cannot be turned away from this peculiar anatomical relation. They cleave to it as a panacea for all dental ills, and not at all as a last resort, but simply as the only means for relief. They care not for professional scientific attainments; they care not for the loss of the dental organs; they feel that they are not maimed for life; they are satisfied with the thought of being relieved from suffering, having in mind all the while the dental substitute.

The classes are tolerant, a few will seek the most skillful; but they will not often go to the limit of the operator's ability to save, preferring to endure for a period rather than suffer for a season.

Must I say it? Is it not because of gomphosis that the dentist rests with the idea that he has a last resort, a mechanical one, and does not strive for higher attainments, feeling that the incentive to broader culture does not exist; satisfied with a knowledge of dental technics, coupled with some information on pathology and therapeutics, and that back of all is a bridge or plate? Verily, this peculiar relation of the teeth stands as a barrier to his progress beyond mechanics.

How different it would be if the anatomical relation of the teeth to the bone were different, so different that they could not be removed without a surgical operation of a major degree, or, if removed, they could not be substituted.

The real value of a tooth, by the majority, is in proportion to the pain of extraction. Anæsthetics have aided much in reducing the value. With a certain class the value is rated by the appearance; with another class, and the only true class, but a small one, the value is rated by the true service of the tooth.

With all classes the loss of a tooth is not looked upon as a calamity that cannot be rectified. This indifference fixes the standard of the dentist below that of other specialists.

For comparison, take the sense of hearing. What a calamity it is to lose this sense even in one ear. Every effort and all means are used to save it. The limit of the purse is gone in seeking skill, if necessary, for there can be no substitute; the only thing is to save, if possible.

Suppose an artificial eye could be substituted for a natural one with the same degree of functional activity that an artificial tooth possesses, would it not lower the profession of the oculist to a standard far below its present exalted position? Would it not invite hordes into the vocation whose only claim would be that of making eyes? Would there be sufficient incentive for the oculist to strive for higher attainments surgically? Would it not be, "I will try, and if I fail you can have a substitute"? So it is with the dentist; circumscribed without the proper incentive; thrown, as a last resort, upon a mechanical substitute.

Verily, gomphosis is a barrier to professional progress that cannot be swept away.

Reports of Society Meetings.

NATIONAL DENTAL ASSOCIATION.

(Continued from page 31.)

Third Day.—Afternoon Session.

THE discussion of the papers read by Drs. Black and Johnson was opened, on Thursday afternoon, by Dr. Bryan (Basel, Switzerland). He said that the views expressed by Dr. Black were so opposed to the early teachings in operative dentistry as to be almost revolutionary. He was not prepared to say there was anything radically wrong in these views, but he did not feel prepared to discuss them. We need more information, more light, on these subjects. One says, the cements are the best thing we have to prevent further decay; another says, they all leak, and are porous, and are, therefore, unfit for use in the teeth; and so we seem to be all in the dark.

Dr. S. B. Palmer explained that his theories as to the etiology of decay were not opposed to those of Dr. Black, Dr. Miller, or Dr. Williams, but were on an altogether different plane. They represent different phases of the question. They are no more antagonistic than the links in the endless chain of evolution. From mineral to mind there is no break; all is light, order, and beauty. From mineral to vegetable, from vegetable to animal in the different stages of unfolding, a vital principle runs through the chain,—a principle which we cannot weigh, cannot measure. Dr. Palmer reviewed the steps by which he had been led to the adoption of the theory, dating from his personal experience with a retaining-plate worn in the mouth in 1847, and the peculiar effects observed in contact with food, in the generation of a distasteful current, and the experiments subsequently undertaken in the study of the subject.

Dr. Corydon Palmer spoke of the methods in use in earlier years, especially the use of tin, and tin and gold, in the preservation of children's teeth. Good results were obtained, and if the practice was good then, running back as far as 1839, it is good to-day, for teeth decay now just as they did then, and what preserved them then will preserve them now.

Dr. H. H. Jackson spoke of Dr. Black's views on the subject of

environment and the constitutional causes which produce changes in the local environment; also, the effects of local deposits of matter between the teeth and in other protected localities. The teeth are hard enough to last a lifetime, if all conditions are favorable; but there are also teeth that can be cut away like chalk.

Dr. Laurence Leonard spoke of Dr. Black's remark that treating tooth-tissue and vigorous growth were among the prerequisites to immunity for dental caries. These conditions may be acquired by early attention to the removal of useless roots, the prompt filling of all cavities, and the proper use of the brush. These will conduce more towards good environment than the use of medicaments.

Dr. Hofheinz said that the cause of caries was formerly looked for in the condition of the teeth themselves, but, through Dr. Black's exposition of the subject for us, we are to abandon our reliance upon clinical experience. The patients shown by Dr. Brophy were a wonderful illustration of atavism. He wished to ask Dr. Black if, in his studies of heredity in connection with decay of the teeth, he had noted this principle of atavism.

Dr. Black replied that he was not prepared to answer that question without consulting his records, but he did not at the moment recall any instance of a recurrence of the conditions in the teeth of the grandparents being reproduced in the third generation, skipping the parents altogether; he was not prepared, however, to say that it was never the case.

The special order of business, a general address on "Dental Electricity," by Dr. L. E. Custer, occupied the rest of the afternoon. For Thursday night, the special order of business, the consideration of the report of the Committee on Revision of the Constitution, was followed by a continuation of the discussion on the papers of Drs. Black and Johnson. The discussion was resumed by Dr. J. N. Crouse, as follows:

Dr. J. N. Crouse hoped that the theory of extension for prevention, which is a debatable question, would receive free discussion.

Dr. J. Y. Crawford said that the papers under consideration challenge comparison with anything that has ever been written on these subjects. He said that amalgam should be eliminated from the list of materials to be used in the treatment of teeth. A low hiss being heard at this point, Dr. Crawford said, "That hiss will not down me when I know I am right: there is too much at stake; human life may be involved." With this exception, if Dr. Johnson's paper were printed as a leaflet, and sent to every dentist to be

memorized as the Lord's Prayer is memorized by every good Christian, it would do great good.

Dr. B. Holly Smith said that with dentistry, as portrayed in the papers under discussion, children will no longer approach the dental chair with dread; the youngsters will come to us willingly and gladly. He said, "I congratulate the modern conservative dental operator on the new attitude of the public mind towards dentistry." It has been said that the dental profession is increasing out of proportion to the population. But with dental practice as human and conservative as advocated by Dr. Johnson, there will be fifty per cent. more done. People will no longer stay away from the dental office because of wrong impressions and dread of dental operations.

Dr. Garrett Newkirk spoke of the value of the combination of cement and amalgam; partly filling a cavity with cement and finishing with amalgam, thus getting the benefit of the wear of amalgam and the adhesiveness of the cement. Little children, where it is difficult to use the rubber dome, will often enjoy acting as assistant. Give them a hand-glass, adjust an absorbent pad or a piece of punk, and show them how to hold it in place between the cheek and the tooth. They will often become so interested in thus being of assistance that they will forget their own discomfort. Dr. Black having been for more than forty years engaged in this practice, and having kept complete records during that time, has facts at command; an immense mass of material from which to draw conclusions, so that the man who attempts to refute his conclusions should be sure that he is well armed.

Dr. Darby spoke on the subject of using arsenic in the deciduous teeth, saying that it was most generally condemned; he knows of no reason why it may not be used with proper precautions. He has used it for the past ten years, and has yet to see the first indication of unfavorable results. Of the use of gold in the teeth of young children, he said the pulp must always be taken with consideration, and the dangers from thermal changes. He considers it better practice to hold them along with cement and gutta-percha until the tooth has attained a greater degree of hardness. The results of experience and observation are entitled to more credit, and, although he did not like to pit his own observations against the results of scientific investigations, still, he could not but disagree with them as to the use of gold in young teeth.

Dr. Bogue regretted that more had not been said as to the value

of tin and gold, and of tin alone, in the management of the deciduous teeth. He hoped the value of these materials would not be overlooked.

Dr. McKellops urged the use of oxyphosphate cement in children's teeth, keeping them along until it is possible to operate, as is necessary for permanent work. Even for permanent gold work a foundation of cement at the bottom of the cavity will save much time and labor. There will be no decay under it, and you can put what you choose on top of it. For old people, who cannot stand long operations, you can save the teeth for years and years with cement. If it wears away, it can be replaced with but little trouble. He said, "I am not ashamed to have any one look at my work of this character. Try it, and see what you can accomplish with it. If you will use amalgam, put cement under it, and keep the mercury away from the dentine. It will create no soreness, and it will not leak."

Dr. Harlen expressed his surprise at the conclusions drawn as to the penetrability of cement from cylinders placed in bottles of dye. *Dr. McKellops*, an old and experienced practitioner, and *Dr. Darby*, a professor of operative dentistry, in the face of these experiments, say that the cements will and do preserve the teeth. Laboratory experiments and practical experiments do not go hand in hand. Shall we go on using the cements, or shall we abandon them? If the experiments are to be relied upon, it is not safe to use the cements in the teeth because they leak. But it must be borne in mind that conditions in laboratory experiments are not those which obtain in the mouth. There is much, in the manipulation of the cement as mixed for use in the teeth. Some are so skillful that these cements do not either shrink or expand.

As to the use of arsenic in the deciduous teeth, *Dr. Harlen* said the risk was too great because of the uncertainty of retaining the application, and, if used in the molars, it may result in the non-appearance of the bicuspsids, the escape of the arsenic destroying the germ of the permanent tooth. Its use for sensitive dentine has recently been reintroduced; but sooner or later it is to be apprehended that these teeth will be found to be pulpless, if not abscessed. The presence of arsenic is fatal to the vitality of the pulp. It is not safe for the majority of practitioners to use such a destructive agent. When, because of lack of physical strength or mental stamina in children, we are unable to do the thorough work we would like to do, it is better to sterilize the pulp-chamber and leave the

root-canals open ; even resorting to the old-fashioned plan of drilling into the pulp-chamber beneath the gum, rather than attempt ineffectual root-filling.

Dr. Sitherwood said that the method of manipulation, and also temperature, had a great deal to do with success or failure in the use of the cements. He has found the citrate of silver, used in the manner usual with nitrate of silver, superior to the latter in treating the deciduous teeth for the arrest of caries.

Dr. Geo. Vaun has been greatly indebted to the author of the phrase, "Extension for prevention." Studying carefully its full meaning has led him to greater care in the formation of cavities, with beneficial results. He has also been greatly benefited by the adoption of *Dr. Bonwill's* methods in the use of gutta-percha in approximal cavities in children's teeth, preserving not only the teeth themselves, but also the space in the jaw for the advent of the permanent teeth.

Dr. W. V. B. Ames wanted to correct the impression that there was any discrepancy between the results with cement in the teeth and in the laboratory. No claim has been made that every cement will shrink or leak in the mouth. The difference in the results is found in cements and in the dry condition, from lack of the water of crystallization. In the mouth, in contact with dentine, shrinkage is overcome because it is kept moist at all times. There are different degrees of porosity in the cements, and there are methods of overcoming this. *Dr. Johnson* presses the cement in hard with the finger. *Dr. Pearsoll* advocates the use of a tin matrix, pressing it hard against the cement, which gives a beautiful surface.

Dr. Bogue.—Those who come to us are those who need treatment at our hands. The whole do not need physic. He said, "I have seen sets of thirty-two teeth that were self-cleansing. I have seen a gentleman of fifty-three years of age who had never put a tooth-brush near his mouth, and his teeth were as nearly clean as any that I ever saw. He had only one spot that had needed a filling. Why was he immune? I do not think I know. The teeth were well worn, and in places the enamel had failed to coalesce, but the dentine was complete. Triturating was done accurately, and there were no deposits of it from food, no sordes. Look over the skulls in any museum and you will find many that were immune."

Dr. Conrad.—In the insane there is a peculiar wasting away of the cementum, a wearing away of the root-substance,—a condition not mentioned in our literature. He was sorry to see the remarks

of amalgam workers hailed with applause, as he considers that amalgam has done more harm to the dental profession than all other causes put together. A low grade of dental practice makes a market for amalgam.

Dr. Black, in closing the discussion of this paper, said that he had limited the easy filling of children's teeth as closely as it should be limited. We must not destroy the confidence of the child, nor break down its courage, nor injure the nervous system. But to do our whole duty, we should fill permanently, at the earliest possible moment, and then there will not be so much to do in later life. There are many cases in which we are obliged to temporize; but we should endeavor to bring about the conditions that will permit of permanent work. Pulpas do not die in consequence of gold fillings in children's teeth in as large a proportion as in the teeth of adults, and I have put in many as early as eight years of age.

As to the conditions of immunity, there is much that we do not know yet, but we should study the question and endeavor to elucidate it. It is an admitted fact that conditions of immunity confront us continually, they are to be found in every community. Let us seek out such cases and study them. It is not a subject for laboratory investigation, clinical study must precede laboratory work in this line. Take it home with you as a subject of thought, and report your findings.

Dr. R. Ottolengui read a paper entitled "Pronathism, Extraction, and Delay *versus* Expansion and Early Attention." This paper was a history of two cases from practice, both of prognathisms upper jaw. In one case, the work was undertaken prior to the eruption of the permanent cuspids. The other case was first seen by *Dr. Ottolengui* when the patient was nearing her fifteenth birthday, at which time the temporary cuspids were still in place, while the first permanent molars had been extracted. Models taken by a previous operator at the age of ten showed a marked resemblance of this case at the same age, with the case first mentioned, the same teeth being present with the same malposition. In the case undertaken at the early age mentioned, the jaws were brought into good pose, the teeth in good occlusion, and asymmetry, both internal and external, secured without the sacrifice of any of the permanent teeth. The appliances used in both cases, the gradual progress at different stages, and the final results, were shown by large charts, without which description would be inadequate.

The special order of business at three P.M., Thursday, was the general address on "Dental Electricity," by Dr. L. E. Custer, Dayton, Ohio. Dr. Custer said that in the presence of the marvels of mechanical and electrical ingenuity embraced in the Niagara plant, the time and place were most opportune for the consideration of electrical science and its practical application in dentistry. After a brief review of the experiments of Galvani and Volta, the discoveries of Davy, the work of Oersted and Ampère, Faraday, Varley, Sièmens, and other noted electricians, Dr. Custer traced the progress of electric science in its application to art and science, medicine and surgery, and the advances in dental practice through modern electric science. The field of its useful application in medicine is narrow when compared with dentistry, where it is made available in the various forms of power, heat, light, and chemism. No energy at our command has such a wide range of action, and is at the same time so easily and so accurately regulated, as electricity. As a source of light and heat, it is unequalled for convenience and cleanliness and purity. As a source of heat, it ranges from holding a glass of water at the temperature of the blood to the intense heat required to fuse platinum. As a source of power, it is noiseless, when properly used. The electrolytic property of the current finds its application in cataphoresis,—for the treatment of sensitive dentine, for the projection of medicinal agents into the tissues, for lining root-canals, and for bleaching teeth. The X-ray has an appropriate and useful place as an unequalled means of diagnosis. These are but mere indications of the part electricity may take in the dental practice of the future.

The night session of the third day was devoted to the consideration of the report of the committee on amendments to the constitution, the changes proposed by the committee having been embodied in an *annotated copy* of the constitution, which was distributed among the members in order that they might be prepared to act understandingly. The amendments proposed by the committee were, with two exceptions, adopted by unanimous vote, after more or less discussion of the points involved.

The most important feature in the revision of the constitution is the provision for an Executive Council, to be composed of the president and secretary of the Association, and five members, to be elected annually by the Association. All matters of business, not otherwise specially provided for, go to the Executive Council without debate, the decisions of the Council being reported to the Asso-

ciation daily for ratification or rejection without discussion. The meetings of the Council are to be open to all members. The Executive Council will thus dispose of much of the routine business which has hitherto encroached upon the time which should be devoted to the discussion of scientific matters. Charges against members, resignations and reinstatements, reports of officers and Executive Committee, questions referred to the Council by the Executive Committee, and similar matters, will be relegated to the Executive Council.

A rearrangement and consolidation of the sections were also provided for, making six sections instead of ten.

The work of the sections and the section officers is also more clearly defined. Drs. Crouse, E. V. Black, and G. V. L. Brown were appointed a committee to more fully consider its methods of section work.

The amendments to the constitution were discussed by Drs. Stainton, Newkirk, Léonard, Ottolengui, Crouse, S. W. Foster, and Fillebrown.

(To be continued.)

MASSACHUSETTS DENTAL SOCIETY.

(Continued from Vol. XXI., page 58.)

A SEVERE CASE OF ALVEOLAR ABSCESS WITH NECROSIS.

BY EDWIN E. DAVIS, A.B., D.D.S., BOSTON, MASS.

MR. PRESIDENT AND MEMBERS OF THE MASSACHUSETTS DENTAL SOCIETY,—In presenting this paper, I do not presume to give you anything especially new or startling, either as regards the case itself or its treatment and cure.

I do not doubt that many of you have had cases equally severe and cases equally as interesting; yet, since we seldom find among the dangerous cases of alveolar abscess two parallel in their individual characteristics, I shall hope to furnish enough of interest in this to merit your attention for a few moments.

This case is one which came to me about two years ago from the

Emergency Hospital, having been treated there for a week unsuccessfully, in fact, had been growing worse all the time, and, indeed, they had not even located the origin and cause of the trouble. I do not say this with any spirit of criticism, for I think, as a rule, those in charge of the Emergency Hospital are very circumspect and careful.

I will give you as good a description of it as I can. Mr. B. came to my office with the right side of his face well bandaged, looking very pale and sickly, and, indeed, seemed like a very sick man. He removed the bandage, and asked me what I thought the trouble was. I seated him in my chair and observed carefully.

Ordinarily, he wore a full beard, but from the lower part of the right cheek and underneath the jaw the beard had fallen off almost entirely, revealing a badly swollen surface extending from the chin back to the angle of the jaw, and from a point opposite the upper molar teeth down under the jaw and on to the neck. This surface was lumpy and mottled red and purple, almost black in parts, and possessing a peculiar granular feeling as I passed my finger lightly over it.

Reddish, watery pus was discharging from six different openings, and the flow increased upon the slightest pressure. The remaining hairs of the beard on and near this surface came out upon the slightest tension, seeming to start from a point a quarter of an inch below.

I examined the teeth, and discovered on the right side a wisdom-tooth in good condition and a twelfth-year molar heavily filled with amalgam, much discolored, but to my surprise firm, and showing no soreness upon tapping it lightly with my instrument.

I attributed the whole trouble to this tooth, however, and so informed my patient. I asked him some questions, and he gave me the history of the case.

He had noticed about three weeks before a slight swelling just under the jaw on the right side, possessing some soreness, but not sufficient to cause him discomfort. The next day it had increased and began to pain him, and on the third day was so bad that he looked the object of pity that he was, for the pain had become intense. He had experienced several chills and felt sick all over. He gave up his position and went to the Emergency Hospital for treatment. They gave him a hasty examination, omitting, however, to look at his teeth, poulticed his face, and told him to come back in a day or two if no better. His condition grew worse, and with the

increased swelling the affair broke out under the jaw and discharged copiously. As he seemed no better the following day, he returned to the hospital, and they told him he would have to take ether, and then they would make an incision and scrape the jawbone, after which they thought he would improve.

After a day or two, during which he was trying to make up his mind to go through the operation, he was advised by a friend, whom I had formerly treated, to come to me. Now, in the treatment of this case, if there are any features which stand out prominently, or in any way render it exceptional, they are two in number,—*viz.*, the direct simplicity of the treatment and the completeness of the cure.

Adjusting the rubber dam to the tooth, I removed all the filling and found that it extended deeply into the body of the tooth, even to the pulp-chamber, where I found a peculiar mass of black, powdery substance. I found no pus, but the odor was sufficiently strong to convince me of the correctness of my diagnosis. Washing the cavity with hydrogen-dioxide and then drying it with alcohol, I easily discovered the nerve-canals; that in the posterior roots large and easily defined, and those in the anterior roots contracted and somewhat tortuous. By careful manipulation the broach was carried to the end of each canal, the apical foramen of each was apparently not enlarged, as the broach did not pass beyond, but brought up solid against it. The canals were thoroughly cleansed with dilute formalin, a small twist of cotton was carried into each and left there, some cotton packed lightly over all, and patient dismissed to come again in two days. I saw the case two days after, and was surprised to find so great an improvement. The discharge had greatly decreased and much of the swelling gone. Very little pain and only slight soreness to the touch. The cotton dressing was removed and the interior of the tooth found to be in a much better condition; very little odor and no moisture. The tooth was dressed as before. Into each of the openings on the face I passed a probe, carrying cotton wet with aromatic sulphuric acid. This was repeated several times, and then the openings washed out with dilute hydrogen-dioxide. No cotton was left in the openings, as they were amply patulous.

I did not see the case again for five days: patient reported feeling nearly well, with the exception of some remaining soreness in the face: swelling nearly gone. Adjusting the rubber dam to the tooth, all dressing was removed and the cavity and canals thoroughly dried

with absolute alcohol. Finding no odor or moisture, the whole interior of canals was wiped with formalin and then dried with alcohol again. Using gold wire, 22 carat and 28 gauge, I taper it down at the end with a fine file and try it into the canal until it goes easily to the end, then cut it off, just long enough to come up into the main cavity. In this way I prepare a wire for each canal, and lay them on my operating-table in such order that I may easily distinguish them. Now, with oxychloride of zinc cement, mixed quite thin, I fill each canal, using a gold broach to introduce the cement. I then introduce each gold wire into its respective canal, pushing them home to the end. Over all I place a little of the oxychloride mixed a little stiffer, and allow it to set.

This constitutes what I consider to be the most thorough method of filling root-canals, avoiding all boring or enlargement of canals, which I consider very dangerous. I saw my patient four days afterwards, and found the condition of the face much improved. Some of the openings closed, others partially so, no swelling and no soreness.

I completed the filling of the tooth, and told the patient that, unless some aggravation set in, he need not come for a week. I did not see him for two weeks, when all conditions seemed normal. Slightly reddish spots were the only vestige of the openings. I think the cure was complete, as all symptoms of the trouble had disappeared.

President Draper.—Dr. Davis's paper is before you for discussion. Is there anything to be said on this matter?

Dr. Maxfield.—Inasmuch as the room is getting close and dark, I would suggest that the reading of the two remaining papers be deferred until to-morrow morning.

Motion seconded and carried.

Afternoon Session.

President Draper called meeting to order, and then followed Dr. Palmer's paper.

For Dr. Palmer's paper, see page 84.

President Draper.—Dr. Palmer's paper is now open for discussion, and we will listen to a few remarks by Dr. C. E. Stockwell, of Springfield, who has consented to open the discussion. As Dr. Stockwell is not feeling well, it would be a favor to him if you would move up closer, so he would have to exert himself less.

Dr. C. T. Stockwell.—It was in January, I believe, that Dr.

Williams gave the paper in New York which our friend, Dr. Palmer, was challenged to answer and which he has reviewed so ably to-night. I hope that every member present read that paper very carefully. If he did not do so, he may be surprised to learn that about one-third of that paper was given to a discussion of theories which he has supported the last twenty-five years or so. In that discussion, as Dr. Palmer has stated, was a challenge to me. This occurred in New York, and, unless I am mistaken, believed to have been, as I think it was intended, to mark an epoch in the history of dentistry upon the intellectual state of men. Because of these facts, I am exceedingly glad that Boston and the Massachusetts Dental Society have offered Dr. Palmer an opportunity and the vehicle for meeting that challenge. Another thing, I feel like apologizing to you gentlemen for occupying ten minutes or so of your time. If I take you out, or invite you to follow me out, towards the outermost rim of what I apprehend to be physical science at present, and you think I have taken you further from what properly belongs to the science of dentistry, I shall ask your forgiveness, and promise you that I never will do so again.

Quite unexpectedly I found, only a few days since, my name upon the programme as the one designated "to lay his mind alongside" this paper of Dr. Palmer's "and try to conquer it." In other words, it was announced, without my knowledge or consent, that I was to open the discussion. This selection on the part of our committee would be regarded as a personal compliment of no little value did I consider myself competent to discuss such a paper. But the consciousness that I belong to that class which you have heard denominated as "book-made men" rather than to the few who form their conclusions solely from a direct study of nature,—this consciousness, I say, makes me hesitate about venturing upon any extended discussion.

Some things, however, are pretty clear to even "book-men," and, in my opinion, they possess certain advantages over the merely scientific quarryman who delves for the facts of nature. His sweep of vision may be wider. His horizon is likely to be broader. He is less imprisoned in a partial and sometimes a partisan logic relating to a class of facts. The "book-made man," such as Herbert Spencer, for instance, sees, and is chiefly interested in, *the relations* that one fact sustains to another fact; or, to put it in its broadest senses, the relation that one fact sustains to all obtainable facts as well as the relations sustained by all the facts to the single fact.

And so I say, without fear of contradiction, that the highest knowledge is the knowledge, not of facts alone, but of *relations*. True it is that synthesis is based upon analysis. But a broad synthesis must be based upon no partial or special line of analysis. True it also is that the world has had but few men who were at the same time broadly possessed of these two qualities. All real workers in physical science admit this fact. I have personally heard such men say to these berated book-men: "We will give you the facts. You shall build the building. We are the quarrymen; you the architects."

In the very nature of things this must be so. Life is not long enough for any one man to become a genius in both spheres of human activity. The theories, the creeds, the synthetic philosophies, in short, must be constructed from the work of the great army of those who are, and well may be, content to delve in the great mine of nature and bring forth the golden facts from her infinite storehouse of divine beneficence. And while doing this, no real, sane, scientific worker will waste any energy in trying to belittle the "book-made man" who, revolving in his mind the recorded facts of nature, tries to discern RELATIONS.

What are the books but a printed record of the facts which scientific workers, like Dr. Williams, for instance, have given to the world? Does he advise us to forego the pleasure and profit we derive in reading his own papers? On the other hand, he announces in this very paper which our essayist this evening has reviewed, that if he could know that every student in our dental colleges would read this paper he would be content. What are the one hundred thousand or more of original observations from nature made by or under the direction of Mr. Edison to which Dr. Williams calls attention? Would not these observations make a book worthy of some attention by even other scientific workers? What, after all, is Nature other than a great book,—*the* book out of which flow the issues of life, and to the reading and interpretation of which the entire scientific world is summoned?

Taking the matter, however, in the narrower sense in which I presume the argument to be intended, I will admit that both classes of men possess certain advantages over the other. The man who "lays his mind alongside a physical fact, and conquers it," sees more in that fact than he can report, or put into a book. On the other hand, because of his devotion to a special line, or, at most, to special lines of work, he is apt to be less fitted in the way of broad

interpretations of even his own observed facts. The real book-made man has here an advantage, and in so far as his vision takes within its scope all the facts of nature, so far are his interpretations nearer the ultimate truth.

This much I desire to add to what Dr. Palmer has said in answer to the spirit, if not the exact letter, of parts, at least, of Dr. Williams's paper.

Without attempting to discuss Dr. Palmer's paper (for it seems to me that this is a paper which the audience needs to have time to carefully study and digest before it can be profitably discussed), I may, perhaps, be permitted to call your attention to a few of its salient points; and, first of all, I wish to bring out clearly the fact that Dr. Palmer does not appear here to controvert the scientific conclusions of Drs. Miller, Black, and Williams. Let the point at issue be fully understood. He admits all that these gentlemen claim for their *investigations*. He admits that, as far as they go, they demonstrate, to the acceptance of the scientific world, the accuracy of their work. But Dr. Palmer takes exceptions to the claim that all knowledge of the causes of dental caries is limited to the realm of purely physical demonstration. He does not admit that the last word has been said, and that the subject is closed. He asks them, and us, to go further; and he well says that "the limit to knowledge is bounded by capacity of comprehension." Science itself is in evolution, as he says; and science cannot be defined in terms of physical expression alone. Huxley, the authority which Dr. Williams quotes so freely, says of science, "To my mind, whatever doctrine professes to be the result of the application of the accepted rules of inductive and deductive logic to its subject-matter, and accepts, within the limits which it sets to itself, *the supremacy of reason*, is science." Professor DuBois's (Yale Scientific School) definition is of a still deeper insight. He asks: "May we not define all science as the verification of the ideal in nature?" A more *ecumenical* definition is as follows: "Science is that interpretation of phenomena which best explains all the facts of consciousness."

It seems to me, therefore, that Dr. Palmer's claim, that science cannot be limited to the realm of the purely physical world, is well taken. If it were not so, science would justly be chargeable with gross materialism, something which it long since outgrew, even if the charge ever had any substantial foundation. It is but a very superficial knowledge that to-day brings the charge of materialism against science; and if I were called upon to point out the greatest of all

"influences that retard evolution in dental science," it would be, in my opinion, the narrow, but common, conception of what constitutes science.

True it is, as Dr. Palmer says, "science relates to the *inner life* of teeth as well as to their environment."

Remember, also, that the essayist is dealing with developing or young teeth,—teeth that are still in the active process of building. And when he says that "the functions of the pulp are such as to intelligently direct the construction of the tooth," he touches upon one of the most tremendous and far-reaching deductions that is beginning to be conceded by the world's greatest naturalists, viz., That mind is a correlative aspect of matter; that life and consciousness are practically synonymous terms; that every atom in the universe is alive, no matter in what particular form or combination it may be found; that every particle of matter possesses not only consciousness, but the elements of choice.

The great German naturalist and biologist, Haeckel, came practically to this conclusion years ago. The late lamented Professor Cope, one of America's greatest scholars and scientists, a man as marvellous in his power of synthesis as in his almost, if not quite, unequalled power of analysis, held, with Haeckel, that not only are all the atoms of matter endowed with life and consciousness, but he went a step further, and held that life and consciousness *precede* organism; that life consciously builds its own body or bodily form. Note, also, as apropos to this matter, his definition of life: "I think it possible to show," he says, "that the true definition of life is: Energy directed by sensibility, or a mechanism which was originated under the direction of sensibility." The physicists, also, such as your own Professor Dolbear, of Tufts College, tell us that everything we eat, drink, or breathe is alive, and that these give us life because they are alive, not dead. Our own governmental agriculturists, in their published reports, tell us that the very soil of our farms and our streets is organic; that, instead of being dead, inert matter, as so commonly believed, it is, rather, a mass of living organisms. Chemists, too, in some of their later works, are placing a different emphasis on the words "chemical affinity" than formerly. In some cases that have come to my notice, the most conservative of them are now speaking of the term "affinity" as more or less analogous to the term "choice." And Powell, another of our leading American scientists, in his late book on "Truth and Error, or the Science of Intellection," as one of the fundamental, if not the lead-

ing, proposition of his thesis, makes consciousness one of the primary attributes of the ultimate particles of matter, holding that they not only possess consciousness, but choice as well. These, and many others, may be cited as establishing the fact that life and consciousness are universal and eternal, varying in their phenomena only as organization varies. And it is because of the facts presented by these and like scientific men of our own day and generation that these conclusions are being accepted by the more advanced minds in the scientific world.

And yet, while our modern scientific literature is permeated with such ideas and hypotheses, some of our would-be dental scientific authorities are telling us that enamel is lifeless, because, forsooth, under their microscopes they fail to find organized nerve-fibrils. They forget, it must be, that "there is no longer any use of denying that science has bridged the gulf between the organic and the inorganic," to quote the language of one of our conservative New England college professors of science. Dead matter! There is nothing dead in all the universe but death. Does such a statement need to be substantiated by a physical demonstration in some of our laboratories in order to be acceptable to the rational mind? Not so. It needs, rather, a receptive mind towards the marvellous array of facts that our psychologists, biologists, physicists, and chemists are bringing out in these eventful years, and the perception that can take in, to some extent at least, the *relation* of these facts as correlated phenomena. Mind, not "matter," is now seen to be the dominating factor in organic evolution,—that is, mind and matter are two phases of one and the same thing. It is mind *in* matter, not mind *and* matter,—two separate and distinct entities.

I have dwelt upon this point somewhat for the reason that it seems to me a most important and practical point. From this point of view, while not forgetting in our daily work the conditions of environment, we shall have a deepened and broadened outlook relative to the inner life and functions of these organs that come under our professional care.

There is one point in the paper which seems to me open to adverse criticism. For instance, when the author says that "Force is the life of matter, and that force is electricity," I should not only substitute the word energy for "force," but I should say, rather, that energy is the *manifestation* of life in matter, and that electricity is one of the various and multiple *forms* of energy.

All matter exhibits some form of energy, and it is because of

this fact, or partly so, that all matter is believed to possess life. Life itself is a form of energy, consciousness is a form of energy, mind is a form of energy, and so all forms of matter and all forms of energy come properly within the scope and meaning of the term "vital," as it is commonly used. The origin also of this vital or life-energy, I might say, is now being traced back to some superphysical source embodied in the universal ether. I say superphysical, because, according to our physicists of to-day, ether-energy is an *endowment*, and atomic energy is an *embodiment*; and it is seen clearly now that some form of energy radically different from any known to physical science is required to embody ether-energy in the forms of atoms.

That is to say, the day has come when science, in its analysis of matter, traces it back to an immaterial substance, the ether, and all forms of physical energy back to a unit-energy,—an energy something other, something else, something radically different from any form of energy known to physical science. In short, it is traced back not to the supernatural, but to a superphysical form of energy, manifesting itself in the universal ether as *universal Mind*. Dr. Palmer calls it God. Names are of little account. The great fact is what we want to bring into consciousness. To say, however, of anything, or of any phenomenon, "God did it," explains nothing, as has been well said by a well-known scientific man. I suspect that man is encouraged to try, at least, to find out how "God did it," in order that he (man) may acquire a closer likeness to the "image" Dr. Palmer speaks of. For the image is of the nature of the mental, or psychical, rather than of any physical form. And I do not suppose Dr. Palmer or any other thoughtful man will question the truthfulness of the remark. It should not be understood, however, as Dr. Williams apparently would have us understand, that science has made no progress since the days of Tyndall, some twenty years ago, in accounting for the sources of energy, be they physical or so-called "vital." I dislike the term vital as much as he seems to dislike it. The term life-energy suits me better. For all energy is, at last, one, and one in origin.

Tyndall's statement, therefore, though good as far as it went, is not sufficiently modern to be wisely quoted as utterly disposing of the class for which it was used. And so I should say that Dr. Palmer's position, as set forth in his paper, is nearer the view of modern science than that of his critic, Dr. Williams.

If the foregoing should seem to be a vague glimpse towards

the outermost rim of speculative science, it is, I can assure you, not a glimpse too far away to be of use to us in our daily work. Let the young men here this evening especially make a note of this remark. It is just here where the world's best physicians are to-day, carefully and with hushed voices, reverently feeling their way. And they are agreed, so we are told, that before the first speck of ether was whirled into a vortex-ring, constituting the first atom of matter, Mind, Consciousness, Will, *was*. But with the apparition of the first atom *physical* evolution began. This is where "the supremacy of reason," which Huxley denominates science, carries us to-day.

I do not know enough about the science of electricity in detail to warrant any attempt to discuss much that Dr. Palmer has presented in this paper. I will, therefore, cheerfully leave that part to others, with the simple remark that I am intensely interested in this statement of the matter as it presents itself in its various bearings to his mind after so many years of faithful, earnest, devoted, careful, and self-sacrificing work which he has given to it. There is much in the paper of great practical importance. Of this I am sure, from the fact that I have availed myself of some of these suggestions in my own practice, and have watched results. I allude here to other occasions when he has brought out some of these points and enriched the profession from his great store of experience and knowledge. And as I read the paper in advance, with reference to my duty this evening, I was again deeply impressed with the conviction that the profession owes to Dr. Palmer a great debt of gratitude.

Dr. R. R. Andrews (Cambridge, Mass.).—I had made up my mind to say something in relation to Dr. Palmer's and Dr. Stockwell's papers. But in view of the lateness of the hour, it will be manifestly unfair and unjust to our essayist from New York, so I move that, in place of further discussion of the preceding papers, we listen to the paper from Dr. Bogue.

Dr. E. A. Bogue.—I do not think it would be fair to the Society not to have further discussion of Dr. Palmer's paper.

President Draper.—I think the Society is in accord with Dr. Andrews's suggestion. We will put it to a vote.

On putting the question, it was the sense of the meeting that Dr. Bogue proceed.

(To be continued.)

Editorial.

DENTAL EDUCATIONAL METHODS.

THE recent meeting in Philadelphia of the National School of Dental Technics naturally has led educators in dentistry to consider the grave problems that surround dental training at the present time and the prospect for the future.

The meeting, which was largely attended from all parts of the country, gave evidence, not only through the exhibits, but from the papers read and discussions thereon, that there was a healthy determination to seek out the best methods for dental education, and to spare neither time nor money in their accomplishment. There is no need for discouragement in college work, when men are willing to cross the continent to spend three days with their fellow-workers over the problems of the curriculum, and how best to overcome the difficulties environing this work.

The dental colleges have been exposed to a continued storm of criticism from those not conversant with the work, and it would seem that these detractors might receive, in this unselfish devotion, an object lesson that ought to cause them to retire to everlasting silence. That this will be the result is scarcely to be hoped for; certainly not until the old generation, who regard the laboratory as the sum total of dental educational excellence, has passed away.

The National School of Dental Technics, like many other organizations, began its life in somewhat crude conceptions of its work; in fact, its attitude towards dental education had the effect of driving many away from it, and this feeling with some still continues. Experience has changed this, and has led up to a modification of name to cover the broader conception of its duties and responsibilities. It is this departure from the original narrow conceptions that ought to attract the co-operation of all dental educators. An association is needed in our profession where there can be a free interchange of thought as to the best methods of training under-graduates in our colleges. Dental educators naturally adopted methods that had been in use in medical teaching for many centuries, and at the beginning these were satisfactory. The time came, however, when it was apparent that new methods must be adopted. The curriculum expanded and became a burden, and its re-arrangement a necessity. This

led to the organization of the National Association of Dental Faculties, with the hope that all difficulties would be met and conquered through interchange of views. Sixteen years have passed since that original meeting, and the work of that body stands out prominently as the most important factor in dental educational progress. It can be stated without fear of successful contradiction that the results of its efforts have been of more value than all others in elevating the standard, unifying the work, and establishing dental education upon a solid basis for the future. Its work has been, however, mainly of a legislative character, and has not advanced materially the internal educational forces in the several schools under its jurisdiction. This has not been in accord with the original conception of its founders. It was supposed that three or four years would accomplish, practically, all that might be desirable in this direction, and that the weightier problems of student-training would receive due consideration. Up to this period this has not been done, and the "Faculties" is still yearly struggling with questions that have largely ceased to have general interest. The fact that it seemed impossible to secure proper consideration of questions in dental pedagogy led to the formation of the School of Dental Technics.

The question that now interests the writer, and, perhaps, many others, is, why there should be two distinct associations, avowedly with the same object and composed of the same men? To call two associations together, thus composed, at a large expenditure of time, money, and vitality, seems to be a waste of energy. If this were confined to a small territorial area there might be a value in separating the work, but when a continent, embracing thousands of miles is considered, it does not seem to be a wise method of procedure.

If the School of Technics is to be continued as a separate organization, it would seem that the best course to adopt would be a meeting once in three years. The reason for this proposed change must be apparent. One year is too short a period to effect any marked results in methods of work. The members come together and listen to papers and discussions that, in the main, reiterate the ideas of the previous years. In time this grows monotonous, and interest flags and the organization eventually dies.

The better plan would be to amalgamate the two organizations, either forcing the Association of Faculties into the School of Technics, or the latter into the former, thus combining the work

of both and materially strengthening both associations, and that without sacrificing the work of either.

It must be evident to those interested that the work of the Association of Faculties has not been entirely satisfactory of recent years. The time of this body has been largely occupied in considering matters that should have been disposed of in other ways, and have thus allowed the members time to consider educational problems.

It is very clear that if the Association of Faculties does not quickly move to a broader comprehension of its legitimate work, the time cannot be far distant when those schools that have little to gain by continuing in membership will lose all interest. The higher schools cannot affiliate with those who continue to adopt the political methods so openly made use of at Niagara and the meeting the preceding year. Their interest lies in maintaining a standard that will give a higher scholarship and, through this, an added dignity to dental character.

The next session of this body must certainly meet the demand for more time. It is either four years, or a reduction in the demands of the curriculum. It must be evident to all experienced teachers that we are graduating men of partial culture in many things and experts in nothing. The practical branches are suffering as never before, and this in spite of the time devoted to technical work. The Association of Faculties raised the entrance requirements to the second year of a high school, and some of the schools require a diploma from such a school. It is too early to express an opinion as to the value of this higher entrance standard from the practical side, but from present indications dentistry will have in the future a body of men of broader intelligence, but inferior in those qualities that make the practical dentist.

The time of the meeting at Old Point Comfort in June next should not be taken up in considering unimportant matters, but should be mainly devoted to the higher questions that this article has endeavored briefly to point out. It is for the men connected with the two educational organizations to calmly consider the difficulties that lie in the path of the earnest college educator, and this can better be accomplished by a united effort and a reorganization upon broader lines than has heretofore been regarded as essential.

DENTISTS IN THE ARMY.

IF the newspaper reports from Washington are to be relied upon, there is an excellent prospect of dentists being placed in the army as contract dental surgeons.

The bill now before Congress will, it is said, undoubtedly be passed in a few weeks, perhaps in a few days. This sudden change from an apathetic condition to one of activity seems to have been brought about by an "alarming statement" in a report from General Otis that the soldiers in the Philippines, during a year of service in the tropics and through army ration food, have "completely ruined fifty per cent. of their teeth."

Surgeon-General Wyman has replied to an inquiry from Secretary Root, heartily endorsing the project of attaching one dentist to each regiment, and more if necessary.

There has been some discussion as to the rank which these dental surgeons shall hold. This is not of material importance. If the bill is passed, that will be arranged by supplementary legislation, but, as the bill now stands, rank is not taken into consideration.

There will be many details that will require wise judgment in settlement. The bill provides "that three of the number of dental surgeons to be employed shall be first appointed by the Surgeon-General . . . to the special service of conducting the examinations and supervising the operations of the others." This seems a very weak portion of the bill. Those competent to make the examinations will not serve for sixty dollars a month, nor would they serve at all except for a temporary purpose.

There has been considerable anxiety in official circles at Washington as to the possible expense of this new departure. It will cost something to fit out a hundred men, supposing that number may be required; but it need not go to the extent of the cost of a well-regulated dental office. The appliances, chairs, instruments, and material should be of the simplest character. The idea prevails that much gold-foil will be needed. This is a fallacy, for it may not be required at all, for the operations should be limited to the plastics and alloys. If metal is used beyond these, then tin should be employed. It is surmised that the dentist will be forced to do the work with the least expenditure of time possible. Gold, if used at all, should be confined to the officers, and they should pay the cost of material.

There is cause for satisfaction that there is a possibility of a

near settlement of this vexed question. The fact that this will give employment to a large number of young men, valuable as that may be, is not of great importance; but that the thousands of men, both in the army and navy, should be relieved of untold tortures is a matter that appeals to all right thinking minds.

It is a mistake, however, to suppose that one man can take care of a thousand. The most that any one man can do is to attend, professionally, from six to eight a day. At this rate it would require six months to see each man in the regiment once, and every dentist knows that this is altogether insufficient. The good results will, it is hoped, be so manifest that an increase in the number will speedily follow the first appointments.

The applicants for the positions named in the bill will be required to pass a thorough examination. Those anticipating making application should prepare themselves accordingly.

Domestic Correspondence.

DENTINE PLASTIQUE DU DOCTEUR KLEIN.

BY I. B. DAVENPORT, M.D.

TO THE EDITOR :

SIR,—The following paper read before the American Dental Club of Paris, in October, 1899, with the accompanying protest, was voted by the Club, November 4, 1899, to be sent for publication to leading dental journals of Europe and America.

MR. PRESIDENT AND GENTLEMEN,—During the winter of 1897–98, a man calling himself Dr. Klein, of Buda-Pesth, came to Paris to sell his interest in a pulp-capping which he called “Dentine Plastique du Dr. Klein.”

He sent around samples to dentists for trial, and a few weeks later called to ask for a testimonial.

During that time he sent to the club, for our examination, a section of tooth, filled with cement, over a capping which rested upon the bottom of the pulp-chamber; this was accompanied by the statement: “That this capping and filling had been done in the mouth three years before the tooth had been extracted; the extrac-

tion having been done for the scientific purpose of showing the transformation, during the three years' sojourn in the mouth, of the capping material into organized dentine."

We all examined the section under the microscope, and easily remember the peculiar appearance of the capping.

Soon after, a call from this same gentleman on several members of the club was made, to request a testimonial, which was refused; but not long after we all received a circular (which I here brought along) recounting the virtues of the plastic-capping, and containing an engraving of the sections of tooth sent to us for inspection, with the names of nearly all of us appended to a testimonial in favor of this material.

Nearly all the names on that circular were placed there either directly against a specific refusal to allow their use, or without being asked.

This circular appears to have been published all over the world (it lately appeared in a Mexican dental journal) with our names added against our wish or knowledge, and is helping to sell this stuff of whose composition we know nothing.

Now, about that piece of tooth sent for us to inspect, and this drawing made from the same, which forms part of the circular to which our names are appended, Mr. Dalton can tell you, and has kindly consented to do so.

Mr. Dalton is an expert preparer of objects for microscopical study; his work in the form of "*Dalton's Gems*" is well known.

Mr. Dalton.—Some time ago a friend brought me a section of a tooth, of which a gentleman, unknown to me, wished a drawing made, showing particularly the appearance of a substance under the filling. This cut in the circular mentioned by the essayist is a reproduction of the drawing made by me, excepting that these heavy lines have been made over my drawing, as if marking it off into little squares; in all other particulars it is as I drew it.

When I examined the section from which the drawing is made, I noticed a familiar substance occupying part of the pulp-chamber and supporting the filling. I scratched out a slight fragment, placed it under the microscope, and found it to be as I first supposed, a section of cuttle-fish bone.

I am not a dentist, but when my friend came for the drawing, I casually remarked, "That must have been a clever idea to place a light support of cuttle-fish bone to build the filling upon." My friend replied, "Get out with your cuttle-fish bone! that is new-formed dentine."

I was greatly surprised, as I supposed he knew its composition. After some difficulty he was convinced, but not until I had shown him, under the microscope, pieces of this capping side by side with pieces cut out of cuttle-fish.

Gentlemen, from Mr. Dalton's remarks, you see the imposition shown in that section of tooth; and in this drawing, which has marked over it in large letters :¹

It seems evident that this device was intended solely to make a favorable impression, and facilitate the sale of a product which, if as good as pretended, ought not to need so much misrepresentation.

This improper use of our names gives a false impression.

Mr. Dalton then showed under the microscope preparations of cuttle-fish bone which were made on the spot.

PROTEST.

We, the undersigned, whose names are appended to the affirmation of the success of "Dentine Plastique du Dr. Klein," have never given consent to the use of our names in that connection.

J. G. BRIGIOTTI,
E. A. BOGUE,
G. C. DABOLL,
I. B. DAVENPORT,
C. V. DU BOUCHET,
CHARLES HOTZ,
THEODORE W. EVANS,
J. H. SPAULDING,

JOHN EVANS,
J. MICHAELS,
A. HUGUENSCHMIDT,
JOHN DIDSBURY,
L. SAUSSINE,
GEORGE ROUSSEL,
W. S. DANENPORT,
HENRY DIDSBURY.

¹ "Dentine Plastique du Dr. Klein du Buda-Pesth. Vue de sa transformation dans la chambre pulpaire après trois années de séjour dans la bouche."

Bibliography.

ANNUAL AND ANALYTICAL CYCLOPEDIA OF PRACTICAL MEDICINE.

By Charles E. de M. Sajous, M.D., and One Hundred Associate Editors, assisted by Corresponding Editors, Collaborators, and Correspondents. Illustrated with Chromo-Lithographs, Engravings, and Maps. Volume IV. The F. A. Davis Company, Publishers, Philadelphia, New York, and Chicago, 1899.

This really great Cyclopædia has reached its fourth volume, including, in its consideration of diseases, "Infants, Diarrhoeal Diseases of," to "Mercury." These cover 622 pages.

The work has been fully noticed in previous issues of this journal, and any review of this fourth volume must be but a repetition of the favorable opinion entertained of it from the beginning. It is, in the opinion of the writer, one of the most valuable works of reference issued from the press. The editor says in his preface, "That it is with renewed pleasure that the editor places the fourth issue before his readers. The marked success implied has not only been due to the novel plan of the work,—a general article upon each disease, sustained by the salient points of the literature of the last ten years,—but also to the excellence of the general articles (presented in large type) written by the members of the associate staff. . ."

This volume contains, besides the article on "Insanity," a timely paper on the "Diarrhoeal Diseases of Infants," by Professor Blackader, of Montreal; an elaborate paper on "Malarial Fevers," by Professor James C. Wilson and Dr. Thomas G. Ashton; articles on "Locomotor Ataxia," by Dr. W. B. Pritchard, of New York; on "Intubation," by Professor F. E. Waxham, of Chicago; "Diseases of the Liver," by Professor Alexander McPhedran, of Toronto; on "Meningitis," by Dr. Charles M. Hay, of Philadelphia. These are a few of the notable contributions. The editor has a valuable article on "Leprosy," largely based on personal observations of this disease.

The exhaustive article on "Diarrhoeal Diseases of Infants" is a very valuable contribution to this much-written subject of infantile years. The causes and treatment of the various stages of this "symptom" of disease are very fully considered. The author defines

diarrhœa "as a symptom only; a symptom indicative of increased motor activity and of increased and, perhaps perverted, secretory activity in the intestinal canal." Among the causes he enumerates "summer-heat directly prostrating the nervous system, over-excitement, and *occasionally the nerve irritation accompanying dentition.*" (Italics ours.)

The author gives statistics as to the age of children thus attacked, and these reveal "the fact that the great majority are under two years. . . . Holt has given us the statistics of 3000 cases of diarrhœa. . . . He finds that of the total number, infants under six months form fourteen per cent.; infants from six to twelve months, twenty-nine per cent.; infants from twelve to eighteen months, twenty-four per cent.; infants from eighteen to twenty-four months, seventeen per cent.; and children over two years, sixteen per cent."

While food and environments have largely to do with diarrhœal troubles in infants, and the author is justified in devoting a large portion of his article to these, yet, when he refers to dentition as an "occasional" cause, it is simply to express a profound ignorance of one of the principal, if not *the* principal, cause of diarrhœal disease at the ages named. The fact that infants, according to Holt's statistics, suffer at the rate of fourteen per cent. prior to six months, the period of eruption of the deciduous incisor teeth, and subsequently run up to twenty-nine per cent., with a gradual decrease until the close of the deciduous dentition, it would seem to indicate that the eruption of the series was a prominent factor in infantile disorders. It is, therefore, strange that in all the treatment given no allusion is made to the simple one adopted by every intelligent dental practitioner. If medical men would devote a portion of their work to the histological facts connected with both deciduous and permanent dentition, their articles would have a greater value in determining the origin of many of the so-called diseases of infantile years.

Space will not permit a review of the book as a whole. Each article is a treatise in itself, and is frequently made doubly valuable by the beautiful chromo-lithograph engravings and maps. The opinion previously expressed can only be repeated, that to all workers in general medicine, or the branches of the healing art, this series of volumes will be, when completed, the most valuable works of reference that have appeared for many years.

Obituary.

STEPHEN THOMAS BEALE, M.D., D.D.S.

DR. STEPHEN THOMAS BEALE, the oldest practitioner of dentistry in the city of Philadelphia, Pa., and one of the oldest graduates of the Jefferson Medical College, died at his home, Tulpebocken Street, Germantown, Tuesday evening, December 12, in his eighty-sixth year. His death was due to senile debility. He retained all his faculties up to the time of his death.

He was born in Brighton Sussex, England, May 23, 1814, and came with his parents to America in 1831, the family settling in Albany, N. Y.

He obtained his early education in England, and also attended the Albany Academy. Later he studied dentistry with Dr. McAllister of that place. In 1837 he came to Philadelphia, and attended lectures at the University of Pennsylvania and at Jefferson Medical College, taking up the study of both medicine and dentistry. He matriculated at the Jefferson College with Professor James Bryan as medical preceptor, and Dr. Lee as dental preceptor, and graduated from the college in 1847, receiving the degree of M.D.; and from that time until 1851 he practised both medicine and dentistry, starting in the latter profession in 1840.

The work of both professions, however, being too laborious, he devoted himself wholly to dentistry.

His dental practice covered a period of fifty-two years in Philadelphia, when he retired after a successful and lucrative practice.

He was known, with the late Dr. Ely Parry and Dr. John DeHaven White, as one of the "Fathers of Dentistry" in the city of Philadelphia, and, with them, was one of the founders of the Pennsylvania Association of Dental Surgeons, which was the first movement in that city for the promotion of scientific dental education.

He was the first vice-president upon its formation, and was the last survivor of its founders. Upon the fiftieth anniversary of the Association, Dr. James Truman, Dean of the Dental School of the University of Pennsylvania, who presided, referred to the period, fifty years ago, as one of transition in the history of dentistry, and the beginning of a new era in the study of science. He eulogized the founders of the organization, and said they could never have

anticipated the number of societies and dental colleges which have been established since that period.

Dr. Beale was also instrumental in obtaining a charter for the Philadelphia College of Dental Surgeons, and on its formation was asked to fill two of its chairs, but was prevented from doing so by ill-health. The college, in 1853, conferred upon him the honorary degree of Doctor of Dental Surgery.

Dr. Beale was a master of his profession, and was interested in investigating and undertaking such cases as, in those days, were considered extreme,—as the repair of fractured maxilla and appliances for cleft-palate.

In his younger days his laboratory was fully furnished with all implements and utensils for the making of artificial teeth; carving entire and sectional blocks and single teeth; also for the smelting and refining of precious metals. For years this laboratory was thrown open to young students, and was well attended.

He was a man of broad views, advanced ideas, bright intellect, and great energy; an old-school gentleman of courteous manners, kindly heart, and domestic propensities; a thorough Latin scholar, a lover of nature and of the fine arts. He has contributed both to dental and literary magazines, and has published poems and other articles of merit, also many musical compositions. His active brain sought recreation in music, which he thoroughly understood and enjoyed.

He was a consistent, active member for thirty years with the Second Presbyterian Church of Germantown.

In his early life he married Miss Louise Boggs McCord, who died twelve years ago. They had a family of seven sons and three daughters, all of whom, with one exception, survive.

Two sons followed their father in the dental profession,—Dr. Stephen T. Beale, Jr., and Dr. Alonzo P. Beale, who died January 4, 1893; also three grandsons.

COMMUNICATED.

ROYAL COLLEGE OF
DENTAL SURGEONS OF ONTARIO
1900 M 4 1500

THE
International Dental Journal.

VOL. XXI.

MARCH, 1900.

No. 3.

Original Communications.¹

FILLING-MATERIALS.²

BY C. N. JOHNSON, L.D.S., D.D.S., CHICAGO, ILL.

A PROPER consideration of the filling-materials in use at the present time leads us at once to the conviction that we have no ideal material with which to fill teeth. We have materials which answer the purpose reasonably well under certain conditions, but no material which answers well under all conditions. It is therefore important that in the consideration of this question we study somewhat carefully the characteristics of the different materials and the indications for or against their use under the varying conditions found in the mouth. This must be done with the fact constantly in mind that no rigid or invariable rule may be laid down for the operator to follow in every case in the selection of his material. He must exercise his best judgment on the basis not only of expediency, but of the history of the various materials under long-continued service.

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the American Academy of Dental Science, Boston, October 4, 1899.

GOLD AND ITS COMBINATIONS.

Of all the materials yet introduced for filling teeth, gold must be acknowledged the peer. When properly understood and properly manipulated, under conditions favorable to its use, it is one of the most permanent materials we possess. It is exacting in its requirements, as are all things worthy, and he who would get the most from its use must adequately acquaint himself with its characteristics. These once understood, and the necessary skill developed to master the details of its manipulation, the operator is equipped with a material which is more reliable than any other, and more definite in results.

Its chief advantages consist in the fact that it may be made sufficiently hard to withstand the wear of mastication; that it is not acted on chemically by the fluids of the mouth so as to change color or disintegrate; that it remains stationary in form when properly condensed, and that it is uniform in its behavior when subjected to uniform methods of manipulation. This latter quality is really of much greater importance than a superficial consideration would suggest. It enables the operator to attain with it definite results, year after year. It will do to-day precisely what it did the day before, or what it did a year ago. This is not true of most other filling-materials, or at least, if it is true, the requirements for maintaining uniformity in the others are vastly more intricate and not so readily comprehended as with gold.

When it is stated that uniform results may always be obtained with gold, reference is made solely to its physical behavior. It is not intended to imply that teeth are uniformly saved by its use, even when it is manipulated to the best advantage. There are extraneous factors entering into the salvation or loss of filled teeth entirely apart from the intrinsic merits of the material with which they are filled, and gold cannot be exempted from these conditions. But it has a greater range of qualities entitling it to respect as a saver of teeth than any other one material, and its thorough understanding should be the aim of every practitioner.

Its disadvantages may be said to consist chiefly in the fact that it is somewhat exacting in its demands upon the operator; that it cannot be manipulated successfully under moisture; that its color renders it conspicuous for anterior teeth, particularly in individuals of certain types, and that it is a conductor of thermal changes. Another objection which must be considered in some patients is the

length of time necessary for its insertion, with its corresponding tax on the individual, and its relative cost; though the fact should be strongly noted that a thorough mastery of the material by the operator will reduce much of this within the limits of tolerance.

Nor must the claim of its exacting nature be held in too high esteem as a disadvantage. This very requisite on the part of gold has done more than any other one thing in developing the skill of the dental profession to its present standard of excellence. Had it not been for gold, or, in other words, had all our filling materials been of a plastic nature, dentistry never would have developed the brilliant manipulators who have graced its ranks. Gold is the stimulative astringent of the dental profession, keeping our operators keyed up to the highest point of proficiency by reason of its imperious demands upon their ability. A good gold-worker is enabled to perform all other kinds of dental service better as the result of his skill acquired in the manipulation of gold, and this sort of training has been the saving grace of dentistry.

Too many sins which belonged properly elsewhere have been laid at the door of gold. Men have attempted its use without a sufficiently developed skill, or without a proper understanding of its necessities. They have ignored its physical properties and its peculiar demands. Other men have essayed with it the impossible, and then attributed their failures to the material, thus laying gold unwittingly at fault.

The fact that gold cannot be successfully used under moisture is neither an unmixed evil nor altogether a disadvantage, when viewed in the light of the greatest perfection of results in our work. No filling, of whatever material, can be inserted under moisture as perfectly as if the cavity were dry, and this necessity of gold simply increases our care and leads to greater certainty of results. It has also made us more expert in maintaining dryness of teeth to be operated on.

The objection of color is a real one in many instances, and the vulgar display of gold in the mouths of the American people is greatly to be deplored. But this may largely be overcome, and the artistic sense of observers less seriously offended than it is without an abandonment of gold in the anterior teeth. A close study of the question will reveal the fact that gold is much more objectionable in some mouths than in others. In certain individuals a well-finished gold filling, beautifully polished without being burnished so as to glisten, is not at all conspicuous, even in an incisor, and not an

offence to the æsthetic taste of the most exacting. In other individuals a gold filling in the anterior part of the mouth is at best an eyesore.

The difference in the effect of gold upon the appearance of individuals relates principally to the temperament and complexion of the patient, as well as to an æsthetic sense on the part of the operator, which may enable him to give his fillings artistic forms. The latter consideration should be carefully studied by every operator, to the end that gold fillings in the future should not be allowed to offend so glaringly as in the past, particularly in those instances where offence is not necessary. As to complexion, it will be found that decided blondes will tolerate gold in their anterior teeth with less objection than will brunettes. In fact, the color of gold harmonizes so well with the former that if the filling is well inserted there is nothing to offend the eye at a distance of several feet. On the other hand, a gold filling in the mouth of a brunette becomes at once conspicuous and objectionable. It is completely out of harmony with the features, and should never be tolerated except under circumstances of the most urgent necessity. This necessity seldom exists, in view of the fact that we have a material at hand which makes a filling scarcely discernible in these cases at a distance of ordinary conversation. This relates to a combination of gold and platinum which, under its proper head, will be considered in detail. The various gradations from brunette to blonde may be met with gold and platinum by using the different numbers as they come to us from the manufacturer, so that fillings may be made which will not be conspicuous, and every operator should acquaint himself with this material.

The question of thermal influence under gold fillings has claimed much attention from the profession, and there has been a large degree of misconception concerning it. Gold has been credited with more mischief in this particular than its merits warrant; for, while the material itself is a good conductor, it can be used in the mouth with little discomfort and little danger, provided proper precautions are taken. Gold is well tolerated, even in large cavities, if the pulp is not nearly exposed, or if there is not hypersensitiveness of the dentine. In the former case the pulp should be protected by an intermediate layer of cement before the gold is inserted, and in the latter case the hypersensitiveness should be controlled by medication previous to filling. Probably one of the best agents for this purpose is ninety-five per cent. carbolic acid.

One important factor connected with this question of thermal trouble relates to a condition apart from the filling itself. In the past, the profession has been very generally advised to leave in the bottom of cavities of any extent a portion of decalcified dentine as a protection to the pulp. Without going into the subject deeply enough to consider the character of this mass of tissue, it is safe to say that irritation is more often caused than avoided by it. It is more subject to impressions—thermal or otherwise—than is normal dentine, and a tooth, other things being equal, will respond to heat or cold more actively with decalcified dentine under a filling than if it had been thoroughly excavated to sound dentine. This cannot always be done short of pulp exposure, and pulp exposure should be avoided if possible; but the idea should ever be kept in mind that infected dentine is a menace to the future health and comfort of the tooth, and should be as thoroughly removed as may be.

If these precautions are taken, the trouble from thermal changes under a gold filling will be found for the most part temporary, and not of such serious import as has usually been attributed to it.

The indications for or against the use of gold in filling teeth relate to conditions most of which must be apparent to every observant operator. It should be used in all cases, if possible, where the greatest utility and the greatest permanence are expected of the operation. It should not be used where the conditions are such that it is manifestly impossible to accomplish perfect work with it. The control of the patient, whether young or old, is a necessary concomitant to the successful use of gold. It should not be attempted with a patient upon whom the physical or nervous tax would be too great, nor should it be employed in a tooth the periodontal membrane of which is so greatly impaired as to revolt seriously against the impact of the mallet. In short, the best judgment and the closest discrimination should be exercised to the end that this king of all filling materials be not crucified by the enthusiastic unwisdom of its chief advocates.

COMBINATIONS OF GOLD WITH OTHER MATERIALS.

Gold and Platinum.—This material makes a harder filling and one capable of greater wear than gold alone. It is also—as has been indicated—possible to produce with it fillings of varying degrees of shade which may be made to harmonize agreeably with the different types of patients which come under our hands. These

degrees of shade are regulated by the percentage of gold and platinum in the given product. One preparation contains more gold than platinum, another about equal parts, while a third has a preponderance of platinum, and the color is thereby affected so as to range from a decidedly yellowish to a decidedly grayish tinge. This variation of the material may be used to striking advantage in harmonizing the filling with the features of the patient. The soft gray platinum shade falls in beautifully with the general effect in the mouth of a decided brunette, while the varying gradations from that to a light blonde may be followed with artistic results by a careful selection of the corresponding shades of material.

The combination of gold and platinum should be employed to a greater extent by the profession than it is to-day, for, while its manipulation is somewhat more exacting than that of gold, its intelligent use will lead to artistic results unattainable with gold alone, and its superior density adds greater permanence to the surfaces of all fillings which are in any way subject to attrition.

Gold and Tin.—This combination of materials possesses qualities which should commend it to the favorable attention of the profession. If its limitations are understood and the cases carefully selected for its use, it will prove a source of great satisfaction both to patient and practitioner; and it is therefore worthy of sufficient merit to induce every operator to study its characteristics and master the details of its manipulation. The claim has been made that it possesses no virtues which may not be found in non-cohesive gold, but in two important particulars this would seem to be an error. The tin-foil imparts to the mass a quality which non-cohesive gold does not possess, viz., a lead-like consistency which makes the product tougher and more readily adapted to walls of cavities. A plugger-point will not penetrate gold and tin so easily as it will a similar mass of non-cohesive gold; and another important item is the fact that the filling will build up more rapidly under the plugger than will gold with equal manipulation. A filling of gold and tin may therefore be inserted in less time than a similarly condensed filling of gold. But probably the most important difference between this combination and non-cohesive gold lies in the fact that in most instances, after a filling of gold and tin has been inserted for a time, the material undergoes a change which renders it much harder than it originally was, or than non-cohesive gold can possibly be made. It becomes crystalline in character, so that the filling is an integral mass, with little distinction between the gold and the tin. When it

is first inserted, it is easily picked apart; but after several years' service in the mouth it becomes almost vitreous in nature, so that an excavator when drawn across it will respond with a metallic vibration. It has lost its dead softness and taken on a crystalline character which greatly increases its resisting properties and adds to its serviceability.

Its limitations consist in the fact that it will discolor in the mouth so that it cannot be used in any position where it may be seen, and also that it can never be built into contours or used in cavities of sufficiently large area to bring any considerable attrition of mastication upon it. The indications for its use relate principally to occlusal cavities in molars and bicuspidis for children, and along the gingival third of deep occluso-proximal cavities in molars and bicuspidis where the main body of the filling is to be of gold. It is especially useful in this latter case on account of materially shortening the operation and avoiding any possibility of discomfort from thermal changes, owing to the reduced conductive properties of the tin in the combination. The rapidity with which it may be inserted renders it a very desirable material in the mouths of children, where the avoidance of the rubber dam is an important consideration.

Gold and tin cannot be expected to do the same length of service as gold in any position where it is subjected to the constant attrition of mastication, and yet many of these occlusal fillings which have been under observation for ten or twelve years give every prospect of long-continued usefulness,—their length of service in most cases being out of all proportion to the limited time necessary for their insertion.

Gold and Iridium.—This combination has gained little attention from the profession, nor has it much to recommend it as a filling-material. By its use a harder surface may be given a filling than is possible with gold, but on being finished it presents a brassy appearance not pleasing to the eye, and it is therefore applicable only to posterior teeth. Even in these cases there is seldom an instance where gold and platinum will not do equal service and present a more artistic effect.

AMALGAM.

This material has been at once the refuge and despair of the dental profession. It has probably saved teeth that never would have been saved without it, but, even in the hands of its most

enthusiastic advocates, it has so often proved a disappointment that observant men can no longer remain blind to its limitations. The investigations of Fletcher, Flagg, Bogue, Black, Wedelstaedt and others have thrown much light on its characteristics; but even with the most that has been learned of it, and the best that has been said of it, the fact remains that much of the amalgam now offered the profession is illy adapted to the permanent saving of teeth. Nor are we likely soon to have in general use amalgams which may be uniformly depended upon,—not because a reasonably reliable grade of amalgam is impossible of manufacture, but because the conditions necessary to produce it are so exacting and the process so intricate that few men will be found sufficiently painstaking to invariably furnish it.

The chief faults with amalgam, as presented to us in the past, have exhibited themselves in a tendency to compress under the impact of mastication, so as to be drawn away from the cavity walls, but more particularly in a tendency to so change form, even after crystallization has taken place and where no undue pressure is exerted, as to produce a serious leak between the filling and the wall of the cavity. This is frequently exhibited in a decided crack along the cavity margins, easily visible to the naked eye, and capable of allowing the ingress of deleterious agents calculated to bring about recurrence of decay around the filling. These cracks do not need to be large enough to be seen in order to invite mischief, and very many teeth have been lost in the past as the result of this one characteristic of amalgam. The color of amalgam is also against it, but particularly the fact that much of the amalgam used by the profession has so changed color after its insertion in the mouth as to render it most unsightly. Neither has the blackening process always been confined to the material itself,—the teeth, in many instances, being so badly stained by it as to remain discolored for life.

These various faults of amalgam have claimed the attention of the profession for years, but no one would seem to have overcome them in any encouraging degree till the investigations of Dr. Black. After the most painstaking study of the physical character of the various alloys, he was finally enabled to produce one which would neither shrink nor expand, and which would sustain sufficient stress to make it reasonably serviceable in the mouth. But the conditions surrounding the manufacture and manipulation of such an alloy are so intricate and so exacting, and the ingredients so sensitive to the

slightest variation in temperature or in treatment, that to produce a uniform product from one time to another would seem to be well-nigh beyond the possibility of human attainment. Manufacturers find that an ingot melted from a given formula may give a certain result, while another ingot from the same formula, and apparently treated in the same way, will show a variation in the result. The closest attention to the minutiae is, therefore, necessary all along the line, from the refining of the original metals down to the filling and annealing of the finished product. Even then no one batch of alloy should ever be sent out short of a final test of the amalgam made from it by the most delicate machinery; and, in passing, it may be stated that when these tests are made they frequently prove a source of discouragement to the conscientious manufacturer. Discrepancies arise at every hand where, apparently, the greatest care had been taken with the preparation, and the more this amalgam question is studied the more it would seem to be hedged about by limitations so great as to be disheartening in view of the immense amount of the material being used at the present day. It would probably be better for the profession and the public if much of the energy which is now being expended on amalgam were diverted to other materials which are capable of more definite and uniform results.

And yet amalgam under existing conditions cannot well be excluded from our present list of filling-materials. It has been too useful for certain purposes, even with its limitations, to be entirely discarded. Its chief utility relates to the building up of teeth so badly broken down or so remotely situated in the mouth as to render the use of gold too exacting, and also to the saving of teeth whose periodontal membranes are so impaired as to preclude the use of the mallet. Employed with discriminating care, amalgam may, under these conditions, serve a useful purpose; but it can never hope to attain to the same degree of excellence as a saver of teeth that has long since been established by gold.

TIN.

The statement has often been made that this material does not claim from the profession the attention which its virtues merit, and this is probably true, though it would seem that the combination of gold and tin possesses all of the advantages of tin alone, together with the added virtue of being better able to resist wear on account of its greater hardness.

Tin may be used in one of two forms,—that of foil, or in the form of shavings cut from block tin. The former is perfectly non-cohesive, while the latter, if freshly cut, is said to possess cohesive properties, though tin cannot be built into contours with any assurance of permanence on account of its softness. The indications for the use of tin are practically the same as those suggested for gold and tin,—it being especially useful in any position where it is surrounded by four walls and is not subjected to wear. It is readily adapted to the cavity, will retain its form perfectly, except under pressure, and it is a poor conductor. This suggests that tin may serviceably be employed in simple cavities on all posterior teeth, such as buccal or lingual cavities of limited area, or in proximal cavities which do not involve the occlusal surface.

CEMENTS.

There are three main varieties of cement,—the oxychloride of zinc, the oxyphosphate of zinc, and the oxyphosphate of copper. The *oxychloride of zinc* is indicated in pulpless teeth, for filling the pulp-chamber after the canals have been previously filled with gutta-percha, and also to form a lining to the cavity under the filling proper. It is seldom indicated in teeth with living pulps, particularly if there is a near approach to the pulp or if there is much hypersensitiveness, on account of its strong irritating properties. Neither can it be relied on for reasonable service in any position where it is subjected to the fluids of the mouth, from the fact that it is so readily dissolved,—this being especially true of proximal cavities at the gingival margin.

The *oxyphosphate of zinc* is an excellent agent as an intermediate under metal fillings in cases where there is a near approach to the pulp,—it being less of an irritant than the oxychloride,—and also for a temporary filling-material in the management of teeth which for any reason may not be in a condition for a permanent operation. Its chief limitation consists in a tendency to dissolve under the fluids of the mouth, though it is not so subject to this fault as is the oxychloride, and there is a considerable variation in its behavior in different mouths. In some instances it seems to wear well for years, particularly if the material used is of superior quality and it receives proper manipulation, but at best it may be accounted only a temporary expedient, and should not be relied on for permanent service.

The *oxyphosphate of copper*, introduced by Dr. Ames, of Chicago, is also somewhat soluble in the mouth, especially in vulnerable positions; and the fact that it is intensely black in color limits its use to positions not exposed to view. It is indicated in remote cavities on the necks of teeth occasioned by a recession of the gum, where the cavity is so ill defined as to make the use of gutta-percha or amalgam difficult. It may be made to adhere to the surface of a cavity very tenaciously, so that little undercutting is necessary, and it will prove an excellent expedient in that particular class of cases for which no other kind of filling seems suited.

GUTTA-PERCHA.

This is a material which deserves more attention from the profession than it has received. In the particular field for which it is best suited it has no equal, and its uses are varied and unique in the saving of teeth. Its chief limitation lies in the fact that it is not sufficiently hard to withstand attrition, but placed in positions secure from wear it gives most excellent results. It is not dissolved by the fluids of the mouth, and it is one of the best of non-conductors. As a temporary sealing agent in the treatment of teeth it is, without question, the best material we possess. It is especially indicated for the filling of pulp-canals, being non-irritant, impervious to moisture, and readily molded to fit any inequality in the canal. It is also very valuable as a temporary filling-material in connection with oxyphosphate of zinc for proximal cavities, the gutta-percha being used in the cervical third of the cavity and the filling completed with cement. Gutta-percha will not dissolve out under these conditions, as will any of the cements; nor will the latter wear away so rapidly under attrition as will gutta-percha, so that by combining the two materials in this manner in the same cavity the operator gains the advantage of more adequate protection to the gingival margin and a better wearing service on the occlusal portion of the filling.

INLAYS.

The discussion of filling-materials at the present time would hardly be complete without a consideration of inlays. The desirability of controlling caries in the anterior part of the mouth, without the necessity for an objectionable display of gold, would seem to be apparent, as also would the possibility of saving badly decayed teeth in any location where the insertion of gold is contraindicated on account of too great tax on the patient, or too much infliction on an

impaired peridental membrane by the mallet. Crown-work, as the result of the considerations just indicated, has often been resorted to by operators in cases of extended decay at a period earlier than would make crowning justifiable if some more feasible means could be employed to tide the tooth over a period of several years. It is in cases of this kind that inlay work finds its most legitimate field. This would seem to be an intimation that inlays are to be considered more or less temporary in their nature, and from our past experience with them, and our present resources in their manufacture and methods of setting this fact, must seem undeniable.

It will scarcely do to point to a few isolated cases where inlays have done an excellent and, to all intents, a permanent service, and thereby claim that inlays are in the main trustworthy for extended use. There are principles involved in the process of their manufacture, and in the means employed to secure them in the cavity, which cannot by any sort of skill on the part of the operator, or any sort of reasoning on the part of their advocates, be overcome so as not to interfere with perfection of results. A metal matrix for receiving the material of the inlay, whether it be of gold, or glass, or porcelain, cannot by present methods be so adapted to the walls of the cavity as to prevent the penetration of moisture; neither can it be fashioned to remain firm in the cavity without something to hold it. To overcome these mechanical discrepancies, some material must be used to seal the interstice between the inlay and the cavity, and to retain the inlay in position by reason of its adhesive properties. Up to the present time no suitable material has been discovered which is not open to the objection of being more or less soluble in the fluids of the mouth. It is true that with an expert and careful operator, and a material manufactured and used in the light of the most recent investigations, these imperfections may in some degree be overcome, but with our present knowledge they cannot hope to be entirely obliterated.

If the too enthusiastic advocates of inlays would recognize this fact, and would more carefully discriminate in their selection of cases, the future of inlay work would be more secure than it seems to be at present. There is a useful purpose for it to perform in the profession, but from existing indications it would appear that it is doomed, as many another worthy object, to be made the victim of its over-zealous friends.

The cases most suited to the reception of inlays are in cavities on exposed surfaces of the anterior teeth, and in large cavities in

bicuspid and molars where filling operations would prove too exhausting. The former should be of porcelain, for æsthetic reasons, while the latter should be of gold. Gold inlays are more easily made than porcelain, and in localities subject to the stress of mastication are much less liable to fracture. They should therefore invariably be used in any position not exposed to view.

It should be a cardinal principle with every operator who uses inlays to so inform his patients on the subject that they shall return at stated intervals for examination of the work, with the expectancy of an occasional resetting as the result of disintegration of the cement. To do less than this with our present light on the subject is to be seriously derelict in duty.

A certain class of patients will cheerfully submit to the periodical replacement of porcelain inlays in preference to having an exhibition of gold in the mouth, and yet it may be well just at this point to look somewhat carefully into the probable results of doing too much of this temporary class of work. While some individuals possessed of a high sense of the æsthetic and with unlimited patience will follow up this work with the faithfulness its nature demands, the great majority will after a time become wearied and fall by the wayside. This is not conducive to confidence in the profession as to their ability to save teeth, and the general impression on the people will be unfortunate. The enviable reputation which dentistry possesses to-day as a calling capable of rendering unique and lasting service to the human race was not obtained by the performance of ephemeral operations. It is the result of hard, painstaking effort on the part of our illustrious predecessors, whose supreme effort was aimed in the direction of producing such work as would prove of the greatest possible permanence and utility to their patients. It is safe to conclude that it could never have been accomplished by the general use of inlay work.

IS IT POSSIBLE TO JUMP THE BITE?

BY EUGENE S. TALBOT, M.D., D.D.S.¹

UNDER the above title appears in the February (1900) *Dental Cosmos* a paper read before the First District Dental Society of New York by Dr. Rodrigues Ottolengui, which presents some comical features.²

"Jumping the bite," he remarks, "means only one thing. It means the movement of the whole jaw so that it bites in a new position, and that position must be forward and not backward. There never has been a bite jumped backward, and there never will be in my opinion.

"My conception of the etiology of these cases is that the lower jaw is behind its proper position. That is, regardless of the deformity in the upper jaw, the lower retreats to a degree which would cause an asymmetry of the external features, even were the upper jaw normal. This being true, it is manifest that a reduction of the upper prominence to a close occlusion with the lower, leaving the latter in its retreated pose, would really be carrying the upper incisors back beyond the line required by beauty, and the retreat of the chin would be as marked a disfigurement as ever. On the contrary, if the upper jaw be reduced to normal only, and the lower be brought forward so that the teeth and lips meet comfortably, the best cosmetic result will be attained. This is to be accomplished by jumping the bite and by no other way.

"In the case which I present to-night (Fig. 1), it was evident at the outset that the upper jaw should be widened, the protrusion reduced, and the bite jumped, as the only means of restoring both the internal and external symmetry. The widening accomplished, the reduction was effected with a gold spring wire, after the method suggested by Dr. Jackson. A plate was made of iridio-platinum fitted with clasps about the molars, to which were attached the ends of a wire which came around the front of the arch. This was made of clasp gold, a loop occurring in the region of each cuspid. These loops are closed from time to time, and afford the tension to the front part of the wire which gradually reduces the arch. This method was adopted because the spaces between the teeth offered opportunity

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² I have copied such parts as are of interest at the present time. The entire article with the discussion will well repay perusal.

for the reduction of the antero-protrusion with much straining upon the anchorage, the plate, however, being relied upon to reduce this strain by giving a bearing against the vault. The correction was readily accomplished and the retainer was the same plate, with a restraining band around the arch, the plate being fitted with the inclined plane which was intended to jump the bite. The models and examination of the mouth disclose that the end was accomplished.

"There is one feature of this case to which special allusion should be made. In the discussion of Dr. Talbot's paper, he advanced the theory that an attempt to move the lower jaw forward would open the bite in the bicuspid region, and he asked those present to make the attempt and see whether a knife-blade could not be passed between the teeth. Dr. Talbot's mistake in that was that he overlooked the fact that before jumping the bite we widen the upper jaw, thus affording opportunity to move the lower jaw forward without opening the bite. Usually this can be accomplished, but it must be confessed that it is not always so, that there are cases where Dr. Talbot's theory holds, even though the upper jaw be widened. This case which I present, was, in a limited degree, of this class. The pose of the molars was such, that in sliding the lower jaw forward the bite opened slightly in the bicuspid region.

"In closing, I desire to make plain my purpose to-night. Dr. Talbot suggested that a case of jumping the bite should be submitted to a committee of three who should report as to the result. It is not easy to find a patient who would consent to appear before a body of scientific men, and I did not imagine until quite recently that such a request would be granted. Consequently the case presented to-night was completed before I thought of showing the patient personally. However, I assure you the models of the original case are accurate, and ask that in the interest of truth in science, those who have examined the mouth and models, will, during the discussion, express an opinion as to the result, remembering that it is about one year and a half since the appliance for jumping the bite was introduced."

This article appeared to me at first merely a practical joke. Turning to the discussion, I was astonished to see that it was seriously considered by the members of the First District Dental Society. The questions naturally occurred: Does Dr. Ottolengui mean what he says? Does he really think he has jumped the bite? Does he really think such an operation possible? Does he believe Dr. Kingsley did it? To answer these questions one must follow Dr. Ottolengui in his paper.

I understand "jumping the bite" to be (exactly as expressed by both Dr. Kingsley and Dr. Ottolengui) a bodily forward movement of the lower jaw at the glenoid cavity, the width of a bicuspid tooth. The "backward" movement of the condyles in the glenoid cavity was added by me because it seemed just as reasonable for the patient to move the jaw backward as forward. When Dr. Ottolengui says that "my conception of the etiology of these cases is that the lower jaw is behind its proper position. That is, regardless of the deformity in the upper jaw, the lower retreats to a degree which would cause an asymmetry of the external features even were the upper jaw normal," he does not seem to understand the etiologic factors of the tissues under discussion. This being the case, he could easily become confused as to the method of treatment and the results obtained.

The tissues of the body when not normal are either excessively developed or arrested from unstable nervous control. In this case there is arrest of development of the lower jaw. The lower jaw does not "retreat." The articulation at the glenoid cavity is normal. The relation of the lower jaw to the upper is, therefore, in this particular case normal. The correction of this arrest of development, as the doctor says, "is to be accomplished by jumping the bite and by no other way." The question arises, Did he jump the bite?

It is wholly unnecessary to submit the case to a committee of three, since the models before and after the operation said to be "accurate" are here illustrated. A study of the illustrations is all that is needed to demonstrate that the doctor did not "jump the bite." By glancing at the two models, the single molar upon the upper jaw stands in precisely the same position in both models against the lower molars. If the bite had been jumped, the two second molars would have stood one upon the other. In other words, the lower second molar would have moved forward the width of a bicuspid tooth, which would have brought the two second molars together. The lower incisors would stand in front of the lateral, instead of behind as shown in Fig. 1. What has taken place in correcting this deformity? The upper incisors, cuspids, and bicuspids have been carried backward the width of a bicuspid tooth. The space where the superior first permanent molar has been extracted has diminished in width. This has been brought about by the second bicuspid standing behind the second bicuspid upon the lower jaw instead of in front of it. The first bicuspid and cuspid have also dropped backward the width of one tooth. This has given

room for the incisors and alveolar process to be carried back into a normal position. It is apparent to everyone that the lower jaw could not be carried forward the width of a bicuspid, and the upper incisors and alveolar process carried backward. Anyone can see that the incisors and alveolar process have been carried backward. Only one operation has been accomplished. It is easy enough to see which of the two movements has taken place. The location of the bicuspids before and after indicate this; the location of the incisors and anterior alveolar process before and after settles that question. It will be seen that just the opposite was accomplished from what the doctor intended. The upper teeth were moved backward instead of the lower jaw being carried bodily forward. He says, "the models (Fig. 4) and examination of the mouth discloses

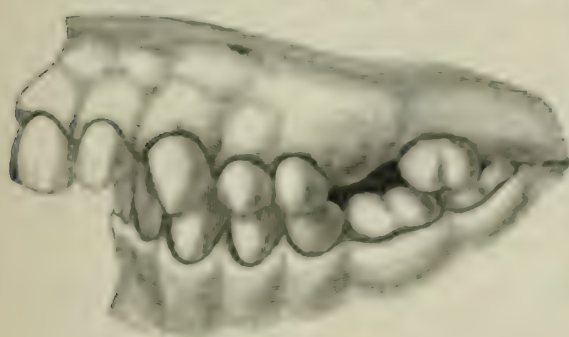


FIG. 1.

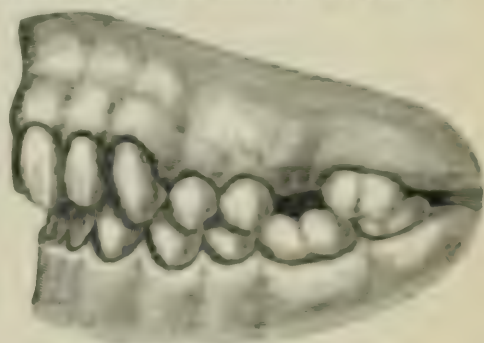


FIG. 4.

that the end was accomplished." That is, he was satisfied with the appearance of the face and jaws. This shows that his judgment was not only faulty as to etiology, but also to the proper method of reducing the deformity to improve the appearance of the face. In this case the results are all that could be expected.

The joke appears to be not only upon Dr. Ottolengui, but also upon the members of the First District Dental Society, in not recognizing what had been accomplished. I have tried in three cases since 1892 to "jump the bite," but have found that in each case, the patient's jaws became so tired at the end of three or four days that it was necessary to give up this method of treatment. I therefore reiterate what I said in my paper read before the New York State Dental Society in 1892, "I have never been able to 'jump the bite,' although I have tried it in a number of cases. I do not believe anyone else has been able to accomplish it, nor do I believe that such a thing is possible."¹

¹ "Dental Cosmos," 1892, page 191.

THE USE OF COMPRESSED AIR IN OPERATIVE DENTISTRY.¹

BY DR. S. FREEMAN, NEW YORK.

AT the request of the chairman of the Executive Committee, Dr. Charles O. Kimball, I have the pleasure of presenting to your Society a paper upon "The Use of Compressed Air in Operative Dentistry," and without any further preliminaries I will describe the apparatus that is used and its mode of application.

Permit me to explain the methods of producing compressed air and the manner of conducting the same to your operating-chair.

It is obtained by means of a suction-pump which sucks in the air and forces it through a pipe to a reservoir, as it is necessary for our purpose to have a continuous and considerable current. I would not advise the use of a hand-pump or small cylinder, as in employing them you will find that both the air and the operator become quickly exhausted. I would therefore recommend that which is known as the champion beer-pump, or the compound pump of the same manufacture, for I find both the simplest in construction, as well as the most satisfactory air compressors on the market to-day.

Before placing the pump in your office, ascertain how many pounds of water-pressure you have; if, as in my office, you have only twenty-five pounds, the champion pump will not furnish, contrary to the claim of the manufacturers, the same amount of air-pressure as water, and there is, as I have discovered, a loss of a few pounds; such being the case, the compound pump (although a few pounds of pressure are also lost) is preferable, as it is frequently necessary to have the air at a pressure of forty to fifty pounds to the square inch.

This pump is connected with the reservoir, which is a tank containing eighteen gallons of air tested to one hundred and fifty pounds pressure to the square inch; from this runs a quarter of an inch block-tin pipe, with branches to my laboratory and operating room; to this pipe I have attached a regulator and a gauge, the regulator being nothing more than a screw-valve; as you loosen the screw you close the valve, and *vice versa*.

From the regulator a pipe leads to the gauge, which indicates the number of pounds pressure.

¹ Read before the New York Institute of Stomatology, November 9, 1899.

I use the eighty-pound gauge, as it enables me to ascertain the maximum amount of pressure to my office.

The pressure generated by the compound pump is sometimes so great that a lower gauge will not register it.

To the gauge is connected a distributing pipe with three small cocks to attach the rubber tubes and the cut-off. The tubes should be of heavy rubber, so as to withstand a high air-pressure. The cut-offs close automatically, and you may use the somewhat antiquated expression, touch the button and the air will do the rest.

In the practice of dentistry it is absolutely necessary to have the mouth in an aseptic condition; to produce this effect, no doubt many of you use the hand atomizer, which, by the continuous pressure of the bulb, causes a slight cramp in the hand; with the compressed-air apparatus we do away with this work; you have the tube steadied and can thoroughly cleanse the mouth or any cavity. I derive excellent results from the following prescription:

R Borine, 1 part;
Dioxide med., 3 per cent., 2 parts;
Water, 1 part.

This makes an agreeable mouth wash applied with a spray.

No doubt you have frequently met cases where you would prefer to place the rubber dam on, but, owing to the patient's inability to breathe through the nostrils, have been compelled to send your patient away, or otherwise work at a great disadvantage.

How often have you cast about for a remedy? It is a simple one,—a two per cent. solution of cocaine placed in an atomizer attached to your compressed-air apparatus, gauged at ten to fifteen pounds pressure; and the spray then thrown into the nostrils will invariably relieve that posterior nasal catarrh or reduce the swollen tissues of the nares to such an extent that you can proceed with your work in a few minutes, without any inconvenience to your patient. In using the spray for this purpose, have your patient sitting upright in the chair, the head inclining slightly forward. Insert the tube horizontally into the nares, and do not apply over ten to fifteen pounds of air-pressure, as otherwise you may set up an irritation of the middle ear.

Where we have nausea arising from taking impressions, placing on the rubber dam, or even pregnancy, a two per cent. solution of cocaine blown directly up the nostrils, so as to have the fluid in contact with the olfactory nerves, will often relieve the severest case of

retching. In using the spray in the nostrils you must not permit your patient to blow their nose for several minutes, as otherwise the fluid may be blown into the middle ear, and subsequent irritation arise.

In stomatitis of the various kinds, the spray employed with a high pressure produces excellent results.

In aphthous stomatitis, which usually requires about a week to ten days to heal, I have succeeded in obtaining a cure in two days.

Probably the citation of the following case will enable you to better understand the value of this agent.

Mr. H., aged seventeen years, applied to me for treatment, May 7, 1895, suffering from large grayish patches situated on the lower and upper lips. These patches were very painful; I applied the following prescription,—

R Pyrozone med., 3 per cent. ;
Borine, aa.

with my atomizer, under forty pounds pressure; in about two minutes it produced bleeding of the sores; washing away the grayish patch, and you could see the ebullition of the pyrozone, leaving escharotic spots similar to those produced by the application of the caustic pyrozone. I gave the patient the mouth wash recommended by Dr. Sudduth, of pyrozone and soda mint; the patient reported on the ninth day of May having no signs of the patches. This method of treatment was not painful and proved very efficient, as I have used it since in similar cases with uniformly good results.

Before applying any medicines to the gums, it is always necessary to have a dry surface, so that the medicament may be readily absorbed and not distribute itself over the surface of the tissue.

I found it somewhat difficult to obtain a dry condition of the gums in the posterior portion of the mouth before applying this apparatus. Now I find it a very simple matter. By drawing back the corners of the mouth with a napkin or piece of cottonoid, and throwing the compressed air directly to the spot, it only requires a few seconds to procure the desired condition of the mucosa, and upon applying your medicines you get immediate absorption.

Now, I again have recourse to the air-pressure, which seems to drive the medicines deep into the tissues.

In periostitis I prefer to use the cold air current, which in itself gives relief to the patient.

In this manner the application of counter-irritants, sedatives,

and local anæsthetics is made easy. With cocaine you do not obtain as deep an anæsthesia as you do by the hypodermic injection of the drug; but with a four per cent. solution I was enabled to lance abscesses within twenty to thirty seconds without pain.

In the treatment of the antrum, no doubt the report of an interesting case of this disease will not be amiss, and will thoroughly explain my method.

Miss M., aged fourteen years, applied to me for treatment on May 7, 1896. Upon examination I found an irritation of the gum between the second superior left bicuspid and first molar, caused by a piece of wooden tooth-pick, which she was unable to dislodge; after removal of the irritant, I painted the gum with a mixture of tincture of iodine, aconite capsicum, and chloroform. On June 26 the patient complained of a discharge of pus and swelling of the left side of the face; I discovered a fistula situated about a sixth of an inch above the border of the alveolus, between the bicuspid and molar.

The second bicuspid was a perfectly sound tooth, the first molar had a small amalgam filling, and upon opening the molar the pulp was seen to be in a healthy condition. I extracted the molar, which was followed by a flow of pus, and after spraying the parts with pyrozone med., three per cent., at a pressure of forty to fifty pounds, found an opening into the antrum about a sixteenth of an inch in diameter; upon removing all the necrosed tissue and cleaning the parts with the spray, I took an impression and had Dr. F. J. McLaran make a small rubber plate to thoroughly close up the orifice. This case was treated daily for a week with pyrozone med., three per cent., and borine, spraying the medicament at a pressure of fifty to sixty pounds, using a Davidson atomizer and sprinkling the extension on the plate with powdered aristol.

I permitted the patient to leave the city, instructing her how to keep the parts clean and keep the plate in an aseptic condition. On July 28 she called, when it was necessary to remove one-half of the extension of the plate. On August 15, the cavity was entirely closed with healthy tissue. September 1, I discharged my patient thoroughly cured.

In the treatment of *pyorrhæa alveolaris* it is absolutely essential that every particle of deposit, of whatever form, shall be removed, and that the *débris* shall be thoroughly washed away, leaving no particles to be ulcerated; to do this it requires a vigorous stream of water.

Attached to my compressed-air apparatus, at fifty to sixty pounds pressure, I use the Davidson spray tubes (filled with pyrozone med., three per cent., and borine), which throw out such copious spray that it lifts the gum-tissues away from the teeth, introducing the medicament directly to the seat of trouble, forcing away all foreign particles and giving a clean aseptic condition of the parts.

I employ these spray tubes, attached to my compressed-air apparatus, for introducing medicine and washing out cavities preparatory to implanting teeth, and I may be concise and say for all wounds and diseases of the oral cavity.

Having considered the advantages derived from the aid of compressed air upon the soft tissues, I will briefly state the results procured through the medium of this agent on the hard tissues, the teeth.

It is not necessary for me to cite in detail the minute anatomy of the teeth, although a thorough knowledge of the structure of the dentine is requisite to fully appreciate the ideas which I wish to convey.

I will therefore ask your attention to a short review of the minute structure of this tissue. A great portion of the tooth consists of dentine, which is composed of an organic matrix richly impregnated with calcareous salts.

This matrix is everywhere permeated with parallel tubes, which run, with some deviation, in a direction at right angles to the surface of the tooth.

These tubes start by an open circular mouth upon the surface of the pulp; thence running outward, towards the periphery of the dentine, they become smaller and break up into branches at a little distance beneath the surface of the dentine. Near the pulp they are so closely packed that there is little room between them for the matrix, while near the outside of the tooth they are more widely separated. Their diameter is also greater near the pulp cavity.

These tubes are subject to slight varicosities, and their course is somewhat interrupted by a small interglobular space.

Each tube is occupied by a soft fibril, which is continuous with an odontoblast cell upon the surface of the pulp; of their real nature some doubts have been entertained, but I will not occupy your time by citing from different authorities.

These fibres cannot be considered nerves in the ordinary sense of the word. There cannot be any doubt but that they are media for the transmission of sensory impressions from the dentine to the

pulp, and that the peripheral sensitiveness can be allayed by local applications.

Drs. Harlan, Kirk, and Truman demonstrated, by experiment, that there is an absorption of liquids by osmotic action. The former states that "thymol will diffuse in moist dentine in from three to six hours at 98.4° F.; that non-coagulants, soluble in water, diffuse readily through tooth structure, as has been shown repeatedly in experiments outside of the mouth; that oleaginous non-coagulants pass through the structure of a tooth quite slowly in the presence of water in serum albumin, and that the vaporizable portion of an essential oil will give to a substance which it permeates the characteristic odor in from three to six hours."

Professors Truman and Kirk show by experiments that coagulants will penetrate the tooth structure, and Professor Truman states "that in proportion to the coagulating power of the agent will be the penetrating force independent of gravitation."

These statements have awakened the profession, and provoke no little discussion, although the controversial period is usually only a passing, and never the most fruitful, period of any truth.

After a science has gained a recognized footing, it has before it its real work to do. The question arises, What can you demonstrate?

These gentlemen have established the fact that medicines will be absorbed through the tubuli *after a certain length of time*.

Now, you will remember that the gluey yielding portion of a tooth contains water to about ten per cent. of the weight of the entire tooth; bearing this in mind, let me ask you, what can we accomplish after dehydration of the tissues, leaving entirely out of consideration the capillary attraction of these infinitesimal dentinal tubes.

It has been demonstrated that when the water is removed from a tooth, the normal function of transmitting impressions seems to be modified. This desiccation can be accomplished by several agents,—heat, cold, and chemicals.

We know that heat or cold will produce pain, and in the application of either we should proceed with extreme caution.

I use a hot-air syringe similar to the S. S. White's No. 30, only this has twice as large a cylinder. The chamber is filled with carbon, which is found to be one of the best materials for retaining caloric, and only requires a few minutes over a Bunsen burner flame to accomplish the requisite amount of heat; with this syringe attached

to the compressed-air apparatus, you can so regulate the flow of air that in from one-half to a minute you have your tooth thoroughly dry; then introduce your medicine, heated to about 95° F., again applying your warm-air current with about forty pounds pressure, and you will be able to excavate your tooth without pain, nor will you have any subsequent irritation. With this method it is not necessary to employ acids in introducing your cocaine, nor is much of your valuable time wasted waiting for the absorption of the medicament.

You can also use the cataphoric action with cocaine, but I would first advise the dehydration of the dentine before applying the current, for in that way you gain better results in a shorter time.

In the bleaching of teeth, I find that by the application of hot air at a high pressure, I am able to produce the required condition in one-half the usual time, as you rapidly evaporate the pyrozone twenty-five per cent., and force it into the tubuli.

It is necessary to be cautious in bleaching teeth so as not to get them too white, as you will frequently observe them somewhat lighter colored on the following day.

In making a tooth perfectly aseptic, the same method of applying your drug as I have recommended in inducing anæsthesia, will give you a reliable aseptic condition of both tooth and root.

For drying out root-canals, use this small point on your syringe, and you can carry heated air directly in the canal, and with a high pressure can force your antiseptic through the canaliculi and tubules, rendering the tissues thoroughly aseptic.

In setting in pivot teeth, we often find it difficult to carry the cement to the upper portion of root. In forcing it into the root-canal with a dry instrument, upon withdrawal of the latter the cement is found adherent to it, and not to the walls of the root; but with a high pressure you can force it into every irregularity of the root, while at the same time the compressed air will dry all the surrounding tissue, and you avoid the necessity of wiping away the moisture excreted by the mucous glands.

Where heat is caused by drilling, using sand-paper disks or strips, by applying the cold-air current you can work without any interruption, for it keeps the tooth at about the normal temperature, causing no irritation. Dr. Oscar Adelberg recommends the use of nitrous oxide gas for this purpose, but compressed air you will find preferable and inexpensive.

Gentlemen, I will not occupy any more of your valuable time

in enumerating the many advantages these appliances have over the ordinary hand-pressure instruments, but will ask you to try them; and I am certainly satisfied that you will never regret having placed this apparatus in your office.

REMOVAL OF SUPERIOR MAXILLA AND PRESERVATION OF FACIAL EXPRESSION.¹

BY DR. C. E. PARKER, NEW YORK.

I AM not in the habit of apologizing, but I think I ought to, when you hear how little I have to say. I do not intend to read a scientific paper and go into detailism, but more especially to speak of facts and methods where results have been very satisfactory in my work. I shall be as brief as possible.

I do not think it is necessary to describe in detail the operation for the removal of the superior maxilla or a portion of it, before this Society, but to speak more particularly concerning the preservation of the natural facial expression after the operation. Assuming that an operation is necessary, the anæsthetic to be used is the next important thought to be considered. I much prefer the use of the local to the general anæsthetic in this class of cases, for the patient often gives me aid and comfort in my work. In nine out of ten cases, I prefer and do use beta-eucain; generally, a two per cent. solution I find of sufficient strength. In fact, for seventy-five per cent. of all ordinary operations, I think it more satisfactory than anything I know of to-day.

By using two per cent. of eucain hypodermically, and waiting fifteen minutes, the anæsthesia or analgesia is complete. This preparation is safer than cocaine, notwithstanding the assurance given us that volasem is the antidote to counteract its physiological action.

For all operations on the maxillary bones (as I confine myself to them), I do not find use for the bone-forceps or saw, especially in the upper jaw. I depend on the surgical engine and the instruments used with it, such as the trephine, drills, hurs, and occasionally the bone-curette.

Seldom is it necessary to use the knife or disfigure the face for

¹ Read before the New York Institute of Stomatology, November 9, 1892.

the removal of the maxillary bones, when one has been educated in the use of the surgical engine. With the aid of the periostotome, the soft tissues are separated from the bone and held out of the way, making the operation comparatively bloodless. Then with the engine and fissure drill, the narcotic parts, such as in necrosis, are cut around and dislodged by the periostotome, as an elevator, or the slender root-forcep, that we are all familiar with. In case of caries, to cut around the supposed zone, and if not complete, then with the round bur follow it up till all the softened bone is removed.

The great advantage in this method of operating is, that you can cut ahead of you, and not destroy laterally any more bony tissue than is necessary, nor scar the face, as is very often done to make room where the bone-forceps and saw are to be used.

Furthermore, what I consider an important feature in this work is that there are clean, smooth edges of the bone, and with very little loss of blood. We have now reached a very important part of this subject, and which may be of especial interest to the dentist, that is, preserving the facial expression, which is so often destroyed by the removal of the superior maxilla or a large portion of it. Since I was asked to speak on this subject, I have been able to obtain a photograph, and consent to use it for this meeting to-night, which tells its own story, as the picture was taken with the artificial denture removed from the mouth. I am glad to show this picture and the result, as it is a patient I operated for last winter, while two members of this Institute were present and will no doubt recognize the person. It is not necessary here to give the history; further, that after suffering much pain for about three months, his physician referred him to me for the removal of whatever necrotic bone was necessary from the superior maxilla. Caries was easily diagnosed, and I removed from the molar of the right side, the alveolus, a portion of malar and frontal processes extending across to the left side (as shown in the picture), taking away the frontal, malar, and alveolar process to the second molar, as well as the palatine process on both sides, leaving only the posterior third.

It can be readily seen that most of the bones that fix and support the anterior facial expression were removed, and the usual result of such an operation is anything but pleasing to the eye in after times, by the sinking in of the nose and features in general.

A method of preserving the natural facial expression in this class of cases, whether the operation has been large or small, is by the use of sheet-lead, so shaped as to restore, lift up, or hold out the

face in its natural position, retaining it there until recovery is so nearly completed that it is of no further use or cannot be retained longer. The lead having been fitted in place, it is then removed and wrapped with at least one layer of surgical gauze, preferably boric acid, being careful to have the ends well covered if it is resisting much force, as the thin edges might irritate the soft tissues. It is then placed in position, and with the fingers it is molded in its proper shape, the metal being soft and pliable enough for that purpose. The cavity is then packed with surgical gauze underneath the lead shield, being careful never to pack to the extreme bottom of the cavity, for in so doing the new tissue is held in restraint and cicatrix formed.

As granulation takes place, the lead must be removed and made narrower, to prevent the new tissue that is forming from coming in contact with it in the bottom of the cavity.

Repeat the cutting away of the lead shield from time to time, until the cavity is nearly or completely filled with the new fibrous or cellular tissue.

Abstracts and Translations.

THE ANTISEPTIC AND DISINFECTANT PROPERTIES OF SOAP.

THE *British Medico-Chirurgical Journal* for September, 1899, has in its pages an article by Symes upon this somewhat homely but practical topic.

With regard to the question, "Can germs live and multiply on soap?" he says that all soaps possess antiseptic properties in greater or less degree. The following experiments serve to illustrate this fact: (1) Fragments taken from the centre of a cake of soap by means of a sterile cork borer, and incubated in nutrient broth, were found in all cases to be sterile. (2) The hands were washed in hot tap-water with each soap; the tablet was placed on a clean surface, and cultures made from the soap at the expiration of three minutes. Those from germicidal and from scrubbing carbolic soap were sterile, and those from izal, toilet carbolic, lysol, and brown Windsor soaps

showed growth of various organisms. (3) Small slabs of each soap were moistened and then heavily inoculated with a culture of *staphylococcus aureus*, and kept in a moist hot chamber for two days. At the expiration of this time the surfaces of the brown Windsor, lysol, and germicidal soaps were sterile, but scrapings from the others all gave rise to growth of the organism first inoculated. On none of the surfaces was there any apparent increase of growth, nor did he find it possible to grow moulds or bacteria on surfaces of soap kept under ordinary conditions. We may conclude, then, that organisms which get rubbed into a soap in the process of washing hands, clothes, or other surfaces, or which may settle upon soap from the air, are not capable of multiplication thereon. Of the soaps tested, this antiseptic property was most marked in that containing biniodide of mercury.

For practical purposes the second point—namely, the disinfectant value of soaps—is the more important. To test this the following method was adopted: A one per cent. solution of each soap was made (this representing what the writer judged to be the strength of the solution which comes into contact with the hands), and to five cubic centimetres of this solution there was added a drop of a fresh broth culture of *staphylococcus*. The tube was then shaken and allowed to stand for a stated period, and then five drops of the mixture were added to a broth tube, which was incubated for forty-eight hours. Obviously, if the antiseptic property of the soap solution was sufficient to kill the organisms in the one drop of broth culture added, then the tubes inoculated from the mixture should be sterile; whilst if the solution had no antiseptic power, or if the time allowed was insufficient, then growth would occur.

Symes does not give the details of many experiments extending over several months, but simply states the result arrived at, viz., that tested in this way it was found that a one per cent. solution of germicidal soap killed *staphylococcus aureus* in one minute, whilst the same strength of izal, toilet carbolic, scrubbing carbolic, lysol, and brown Windsor soaps failed to do so in ten minutes, half an hour, an hour, or three hours. These solutions were, however, all sterile in from twelve to fourteen hours; the exact time in which this result was attained was not observed, nor is it of much importance, for under no conditions would objects be as long as three hours in contact with the soap.

It is a matter of some importance to note that all organisms are not affected alike by soap solutions. Thus the cholera vibrio, the

typhoid bacillus, the bacillus coli, and the streptococcus are killed much more quickly, or by very much more diluted solutions, than are the staphylococci. For instance, the bacillus coli is killed by a two per cent. solution of plain curd soap in from two to four hours. Our antiseptic precautions are, however, commonly directed against the more resistant organisms, the staphylococci, and therefore in testing the germicidal power of a soap it is preferable to work with these organisms. Symes has tested the germicidal soap with bacillus coli, bacillus typhosus, the cholera bacillus, streptococcus and staphylococcus albus, all of which were killed by admixture with a one per cent. solution (equal to biniodide of mercury 1 in 5000) in one minute.

It may be concluded, then, from these experiments, that for practical purposes most of the so-called disinfectant soaps have no value, but that in the combination of biniodide of mercury with soap we have a useful means of disinfecting hands, instruments, surfaces, etc.

Although a large number of trials were made, Symes did not succeed in sterilizing his hands by washing with the soap containing biniodide of mercury, although much better results were obtained with this than with any other variety. This points to the necessity of the operator first washing his hands and then soaking them in an antiseptic solution.

It has been thought that the germicidal action of soaps is due to their alkalinity, especially to the free alkali present. Symes does not think that this can be the case, for Dr. Munro, from a careful analysis of the samples tested, found that the difference in the amount of free alkali is infinitesimal. Moreover he obtained no better results with soaps with high total alkalinity than with the others.

Although the exact combinations formed are not known, there are many observations to prove that certain antiseptics when mixed with soap partly lose their power. This is certainly the case with carbolic acid, lysol, and izal. Rideal, who has done much work on this subject, considers that for an antiseptic soap an olein base is the best. Superfatted soaps are in his opinion not so suitable vehicles for antiseptics as soaps with a moderate excess of alkali. The presence of free fat or oil strongly militates against germicidal action—witness Koch's discovery that carbolized oil has no antiseptic value. Acids and free halogens are incompatible with the fat. Boracic acid is converted into sodium borate, and most mercury salts into insoluble mercuric oleate. Oleates do not generally mix well with soap; fluorides, sulphates, and oxides give better results. Rideal found

the double iodide of mercury and potassium to mix well and form a good antiseptic with soap, compatible with strong alkalies and not precipitating albumin. In composition this resembles the soap with which were obtained the best results.

In conclusion, Symes points out that the matter is one of considerable importance with regard to nurses, attendants upon sick persons, and the general public, who may be led to think that in using so-called antiseptic soaps they are insuring efficient disinfection. There is also an economic side of the question, for most of the soaps impregnated with chemical disinfectants are very much more costly than plain soaps, though as disinfectants they are of no greater value.—*Therapeutic Gazette.*

Reports of Society Meetings.

NATIONAL DENTAL ASSOCIATION.

(Continued from page 123.)

Fourth Day.—Morning Session.

ON motion of Dr. J. D. Patterson, the sum of fifty dollars was allowed the committee for the International Dental Congress for incidental expenses, translations, etc. The resignation of Dr. J. B. Monfort was received and accepted.

Dr. Joseph Head, Philadelphia, read a paper entitled "Physiological Reasons for Supposing that Dentine and Enamel in Pulpless Teeth may be Nourished."

In this paper Dr. Head cites the case of a young lady whose slightest systemic derangement was often followed by obstinate pulp-congestion; for the relief of which, after vain trial of other methods for relief, the pulps were successively removed from the left upper first permanent molar and the first and second upper bicuspid on the same side. All of the canals were filled with oxychloride of zinc. Six months later the patient returned suffering from the same trouble in the lower jaw. As the teeth with living pulps failed to respond to tests, the pulpless teeth were also tested, with the result that the teeth of which the canals were filled gave the most intense pain on

the application of a hot instrument. The pain being most severe in the molar it was opened, when it was found that the zinc filling had become liquefied, and that the entire dentine had taken on so much inflammation that the patient could not bear to have it touched, the pain being quite as intense as if a live pulp had been distributing nerve-tissue and nourishment.

Sensibility was brought under control by daily applications of chloride of zinc, when they were again filled; but for six months they were still sensitive to heat and cold, but this has since steadily diminished and the patient finally obtained entire relief. The dentine in this case remained sensitive and apparently alive for over a year and a half after the removal of the pulp and filling of root-canals, thus proving that dentine has means of sensory communication and avenues of nourishment independent of the pulps. Admitting that the dentine is nourished by osmosis through the lacunæ of the cementum, nerve communication between the dentine and the cementum has never been found by the microscope; but the microscope has probably not yet found the half of what it is destined to find; and it is easier to believe that the microscope has overlooked minute sensory plasma than to believe that sensory impulses between the dentine and gum are carried on by a Marconi-like system. And since the dentine can be thus nourished, why cannot the enamel be nourished in a similar way? Why should not the phosphate of calcium, or some kindred salt, percolating through the tooth, gradually modify the density of the enamel rods or their sheaths? Excavations show that the enamel of five years is less hard than the enamel of forty years; daily observations show that the enamel grows harder in the course of years, long after the enamel organ has been destroyed. Whether this is due to a further calcification of the rod sheaths or to a change within the enamel molecule cannot be affirmed; but since pulpless dentine has been observed to live and have sensation for over a year, it must have nerve-supply and nourishment independent of the pulp. And if it is possible to the dentine by osmosis through the cementum, it is equally possible to the enamel. When we consider how frequently enamel is known to change its color from permeation by blood-plasma charged with broken down hemoglobin, not only the possibility, but the probability, of enamel nutrition by osmosis is forced upon our consideration.

Dr. Bryan, of Switzerland, was given the floor, and spoke at some length upon the status of the American dentist in Europe.

At the conclusion of his remarks, Drs. Crouse, Gordon White, and Ottolengui were appointed a committee to work in the direction of securing the removal of the obnoxious requirements in foreign countries.

Dr. D. D. Smith, Philadelphia, next read a paper entitled "The True Status of Pulpless Teeth."

The pulpless tooth sustains unique relations, being a living organ with the greater portion of its substance dead matter. In the minds of the laity it is associated with a blackened crown and rapid decay. By the profession it is usually considered as an erratic organ with sporadic disturbing tendencies impossible to control, and the cause of many aggravated and serious facial neuralgias, dental abscesses, and various active pathological conditions of the mouth and brain.

The utility of a tooth is wholly dependent upon its attachment in the alveolus; a vital living union, partially if not wholly independent of the pulp. The value of a pulpless tooth rests in the fact that there is a source of nutrition maintained independently of pulp action. With the death of the pulp there is death of the whole crown of the tooth. The enamel and dentine are left absolutely without sensitive or nutritive function. Whatever changes take place in the crown subsequent to the death of the pulp are of a disintegrating, retrograde character, but the vitality of the root, except in the dentine, is not interrupted or lessened. The cementum with its membrane is therefore the most important tissue for the conservation of the tooth; its articulation with the alveolus remains unaltered, and the functions of absorption and nutrition are not interfered with. Pulp endowment, in so far as it affects healthful union between root and alveolus, might be dispensed with without detriment. And yet the votaries of certain fashions or fads teach up the union between root and alveolus—extract, mutilate, replant—without regard to the fact that this all-important relation once disturbed is never restored. Such practice is wholly at variance with the laws governing nutrition as exhibited in other parts of the osseous system. Extraction destroys the life of the cementum and the periosteum, depriving the root of cementum and of the only tissue through which restoration to vital union is possible. Extraction and replacement are physiologically incompatible with the office of the tissues involved. Living tissue abhors dead matter and cannot be induced into permanent association, much less vital union. The root portion of an undisturbed pulpless tooth is a vital, living organ, exercising its functions as when the pulp distributed sensation and nutrition to the dentine and

enamel. Complete removal of the devitalized pulp-tissue, with proper disinfection of the tubules and intertubular matter, does not interfere with uninterrupted continuation of the normal functions of the tissues which furnish vital attachment between root and alveolus. Such teeth have favorable prognosis in all essential particulars. Pulpless young teeth, those which have lost their pulps before the vascularity of the cementum has been restricted by the contraction of its lacunæ and canaliculi through deposits in its substance, are more subject to cemental accretions than the same teeth with living pulps; but this is not an unfavorable condition, as through it the territory of normal circulation is increased to the benefit of the tooth. A noticeably frequent result of pulp destruction is a closer, firmer union of root and alveolus, due to an increased tendency to deposits of cemental tissue on the surface of the root, and also to the entire obliteration of calcific deposits through pulp influence. A pulpless tooth which has never been the subject of pyorrhœa alveolaris is practically immune to that trouble; in fact, removal of the pulp in the beginning of that disease is attended with the most satisfactory results. With our present methods of crown restoration, the condition of the crown is of little importance. The root should always form the basis of judgment and diagnosis, as upon that depends the permanent comfort and retention of the tooth. The root which has uninjured pericemental connection never questions whether the crown it supports is natural or artificial, but performs all the functions of a tooth with uncomplaining fidelity.

In dealing with a pulpless root devoid of natural crown, there should be free removal of the dentine from the thickest portion of the root, care being exercised not to touch upon the cementum and to leave the typical third practically undisturbed. Pure wood creosote is a specific as a root-dressing, promoting harmonious relations between the devitalized dentine and the living cementum. Crowns having the appearance of the natural organ can be securely applied to any root having the alveolo-dental articulation in a normal physiological condition. For comfortable retention, utility, and desirability, the prognosis is most favorable.

Dr. Charles L. Hungerford, Kansas City, Mo., read a paper entitled "The Physiological Relation of the Dental Pulp to the Economy."

Originally, the dental pulp was a constructive organ, temporarily associated with the economy for the purpose of forming dentine. Its function completed, nature tries to pass it on into other

forms, for there is no standing still in nature. Where growth ceases, decay commences, for the involvement of more perfect forms. While a tooth is distinctly a dermal product, it is a differentiation of that derma that gives rise to the three membranes that produce, respectively, enamel, dentine, and cement, each of which grows at the expense of the organ from which it derived its origin, maintaining its existence independently of that organ in exact ratio to that organ's maintaining or losing its original functions. The entire enamel-membrane is used up by the forming enamel; the dentine serves no other purpose than a go-between, supporting the enamel-shield or the outside, connecting it to the more vital cement underneath, but physiologically wholly independent of either. Cut off the crown of the tooth; drill out the dentine to the apex of the root, the cement still lives, and thrives even better than it did before.

There is but one valid argument against pulp removal, and that is the inability to entirely remove it and fill the space. A human tooth does not depend for its physiological relationship with the economy on either the dentine or the enamel, for neither comes in contact with the economy, and, after the removal of the dentine, enamel, and pulp, there is no impairment of the functions of the remaining dental tissues, viz., cement, periosteum, and alveolar process. The dental follicle, having grown enough dentine to give stability, has performed all the physiological function of which it is capable; any further functioning is of an abnormal character, and is followed by disintegration and pain.

On motion, two other papers offered by the Section, "Counter-Irritation," by Dr. W. E. Griswold, and "Recent Advances in Therapeutics," by Dr. A. W. Harlan, were read by title.

In the discussion of the three papers previously read, Dr. M. L. Rhein spoke in advocacy of the views advanced by the essayists as to the advantages obtained by the removal of the pulps of mature teeth when exposed by decay, and depicted the evils resulting from indiscriminate and vain efforts to save the pulps of all teeth. He spoke of the recent valuable histological work of Dr. Fletcher, of Cincinnati, especially his studies of the pericemental alveolar membrane and the importance of the conservation of this portion of the dental organization.

Dr. G. V. Black said that time would not permit of following through all the points of the paper, but it must be borne in mind that we do not yet know all there is to know on any subject. The

peridental membrane has not received the close and careful study it demands. The nature of the membrane is not generally understood. Although he has individually given it a great amount of study, he feels that he is not yet familiar with it. There is a set of glands that occupy a position in this membrane that are ignored by the generality of the profession, and the cementum itself is not yet well understood. It is a continually growing body becoming thicker as the tooth is older; it is liable to extraneous growths, becoming thick and nodulous. This may occur at any age, but generally after adult age. The process of detachment and reattachment of the peridental membrane to the tooth is not very generally understood. This is a subject that should be studied, especially by those engaged in moving the teeth, in which process the films of the membrane are severely stretched or entirely detached, either from the alveolar wall or from the cementum, and the space reoccupied by new bone-cells or added cementum.

(*Question*.—As we are so often engaged in moving teeth, will you, as a scientific observer, tell us, does the absorption take place in the cementum or in the bone?)

Dr. Black.—The absorption of calcific tissue is from the alveolus principally, though it may be from the cementum also. By the laying down of new cement-tissue, the fibres are unattached, in that the process is the same in replantation. If the conditions are so perfect that this is done on all parts of the root, there will be a perfect reattachment. But when the conditions are not favorable, there will be absorption instead of reattachment, and the tooth will be lost. I agree with the papers that a tooth may very perfectly retain its health and vigor after the removal of the pulp, and its removal is justifiable in many cases. But the question arises, Is a pulpless tooth as good as if the pulp were alive and healthy? In one sense surgery is always an interference with nature. Is the tooth as good? Emphatically no. But in many cases the only way open is to remove the pulp; but the later in life this is done, the better it is for the tooth. In every case, where a tooth-pulp is destroyed, there is a retrograde change in the denture, a molecular change; the dentine is not up to its normal strength after the lapse of time. When, from any cause, there is a recession of the pulp, cutting of the dentinal fibrils, the nourishment of that portion of the dentine is cut off; and when you cut into it you will find that it has lost strength, and continues to lose it, even though the pulp remains alive.

I quite agree with the papers as to the complete death of the dentine after the removal of the pulp, but there is an osmosis through the dentine that influences the integrity of the tooth. If the dentinal tubes are open, there is an increase of osmosis from the saliva and we have a retrograde action. If the tubules are not open for the saliva to flow in, then the osmosis is through the cementum to the dentine, which tends towards its integrity. Every time the saliva is allowed to enter a cavity after pulp removal it is injurious to the dentine. Injury is often done by the chemical action of so-called remedies stuffed into cavities. Whenever a case presents in which it is clear the pulp should be devitalized, by no matter what method, nothing should ever be permitted to enter the cavity but what is placed there by design and with a purpose. Seal it up and prevent the entrance of saliva. But do not destroy the pulp in the teeth of children. The pulp is large; the apical foramen is large and open; you will not get the same results that you do in adult teeth. Those who have kept records of cases for many years, and can say just when such a thing was done and how it was done, will tell you that what I tell you is true. If a pulp is removed from a tooth when it is young, it will not stand the wear and tear of a long life.

In closing the discussion of his paper, Dr. Smith maintained the position taken in the paper, that a pulpless tooth was in every sense as good as one with a living pulp; if the root is living and healthy, it makes no difference for functional use whether the crown is a laboratory crown or a natural crown.

Dr. Hungerford said he had nothing to add to what he had said in his paper.

Dr. G. V. I. Brown exhibited and described briefly the illustrations for his paper entitled "Some Cases in Oral Surgery and the Lessons they Teach," but declined to read the paper, the time being too short.

This was the last paper presented. It was announced that the paper which had been accepted by the Sections and presented for reading, but not read, would go to the publication committee. Theories recommended by the Sections, but not presented at this meeting, would be held over for next year by the respective Sections.

After the election, the result of which has been published, and the final routine business, the Association adjourned to meet at Old Point Comfort, Va., June 26, 1900.

Adjourned.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on Thursday evening, November 9, 1899, at the office of Dr. J. Morgan Howe, No. 58 West Forty-seventh Street, New York, Dr. Charles O. Kimball, in the chair.

The minutes of the last meeting were read and approved.

The Chairman.—As there are no communications on theory and practice, we will proceed to the regular business of the evening. Inasmuch as Drs. Curtis and Lilienthal have not yet arrived, we will reverse the regular order of business. I will call on Dr. S. Freeman, who is to present a paper upon "The Use of Compressed Air in Operative Dentistry."

(For Dr. Freeman's paper, see page 162.)

Dr. Freeman.—I also wish to present a new antiseptic mouth-lamp. The lamp consists simply of an electric mouth-lamp, surrounded by a glass tube. The whole thing can easily be taken apart and cleansed. The double glass also has the advantage of taking up the heat from the lamp. The apparatus can be inserted in the nose, for instance, for several minutes without producing any appreciable warmth.

DISCUSSION.

Dr. John A. Schmidt.—The paper was a very interesting one to me, inasmuch as I have used compressed air for several months, and find it a valuable adjunct to my office. The simple fact that I can use a spray, operated by my lady assistant, while cutting a tooth for crowning or while trimming down a filling, thus doing away with the pain of the operation due to thermal changes, more than pays for the apparatus. Again, before operating, spraying the mouth with an antiseptic bath makes the mouth pleasanter for the operator and is beneficial to the patient. Using the spray after removing the rubber dam leaves the mouth in a nice, fresh condition. For this purpose I use a modified form of listerine, which I find so satisfactory that I should like to give the formula to the Society.

R Benzoic acid,
 Rorax, 4℥ ⅓ ℥,
 Boric acid, ⅓ x.

Dissolve in *hot* water twelve pints.

R Ol. Eucalyptus,
 Ol. Gaultheria,
 Ol. Menth. pip., āā ʒ ii;
 Thymol, ʒ iv;
 Fl. ext. wild indigo as coloring matter, ʒ ii.

Dissolve in six pints of alcohol.

Mix altogether and add water sufficient to make four gallons. Allow to stand twelve hours and then filter. It is usually necessary to filter three times and obtain a beautiful straw-colored solution.

Dr. Freeman.—Do you cut the oils first with alcohol?

Dr. Schmidt.—Yes. This solution is too strong to use and must be diluted in one-half or more of water. For cases of pyorrhœa I use a one-half of one per cent. solution of formaldehyde, coloring this green.

Another nice spraying solution is one put upon the market recently by Johnson & Johnson, called "camphenol."

A five-ounce mixture costs thirty-five cents, and makes with the addition of water, four gallons of spraying-solution. Pyrozone or dioxide of hydrogen with borine or listerine also make good solutions.

We frequently find, in patients with a catarrhal affection, difficulty in breathing when the dam has been adjusted. In these cases I find the following solution very beneficial:

R Albolene, ʒ ii;
 Menthol, grs. v;
 Ol. Eucalyptus, ℥ xx.
 M.—Use in an oil atomizer.

Close the lips firmly on the tube of the atomizer and spray, instructing the patient to inhale naturally and exhale through the nose. A patient suffering with coryza or any catarrhal condition is relieved and thus prepared for the dental operation, making it bearable. If you have not the compressed air and atomizer, any hand oil atomizer will give results which will pay for the trouble.

The method of heating the air for the hot-air syringe is of interest. The S. S. White heater in my hands has not been a success. I think the one Dr. Freeman describes ought to be successful. At present I am using cold air, as I have no heating apparatus. The apparatus which I have been using is made by the Cleveland Faucet Company. I have an apparatus in each operating room, in the laboratory for the blow-pipe, and also for inflating bicycle tires. I have a pump in the cellar, and the whole apparatus only cost me eighty dollars.

Dr. Virgil F. Parker.—I think I have contrived a little hot-air syringe which will suit Dr. Schmidt's purpose admirably. It consists of a coil of very small brass tubing surrounded by a jacket, the whole being filled with molten zinc. The current of air is made to pass through the coiled tube, and when the apparatus has been placed in the Bunsen or the alcohol flame for two or three minutes and becomes thoroughly heated the results are very satisfactory. It will give a continuous hot blast for ten or more minutes, which enables one to thoroughly dry a devitalized tooth to the extreme end of the roots, and I consider this of great importance towards the success of filling roots of teeth. If crowns are set with gutta-percha and for any reason require removal, it is possible to heat the crown sufficiently with this apparatus to soften the gutta-percha and easily slip the crown off.

Dr. W. St. George Elliott.—The lamp which Dr. Freeman has shown us seems to fill the requirements very fully. Of course, most of us know that we can buy an aseptic mouth-lamp at almost any electrical supply stores, made in the same way, only more crude, but which, however, is a very fair instrument.

In regard to the hot-air heaters, some one will introduce an instrument which answers the purpose fairly well. It will be taken up by the profession and used very largely until some one finds out that it is exceedingly inefficient. The reason for this is that many of our appliances are not tested for efficiency.

If you go into a manufacturing concern and inquire regarding any given machine, you will be told what commercial and theoretical efficiency the machine possesses. About a year ago I commenced a series of experiments to determine which was the most efficient. I took one milligram of water, and with the different apparatus heated for the same length of time in the same Bunsen flame, I evaporated that amount of water. The first thing that I ascertained was that the carbon which is put in so many of the heaters is not only useless, but is absolutely a detriment. I also found that in an absolutely new instrument no evaporation whatever took place. This was due to the fact that the paraffin which covers the carbon when it is new, melts and forms a covering over the water, preventing evaporation. I found that the most efficient heater is the Perry, which is a little cone of copper or silver at the end of a syringe. I also experimented with long tubes of brass, one-sixteenth of an inch in diameter and about fifteen feet long. These were formed into a small coil and placed in a tank of boiling water. Passing a

stream of air through this tube I found that the results amounted to nothing. The air passed through the tube so rapidly that it absorbed practically no heat whatsoever. I am now experimenting a little with a view to using the gas blow-pipe itself. An excellent method of introducing medicinal vapors into root canals is by heating an ordinary syringe in the flame and then drawing a drop of the medicament into the syringe and returning it as vapor.

I have also made an electrical apparatus for pumping the air, the hydraulic apparatus being very apt to break down.

I have a little fan motor behind my cabinet, on the floor, which runs a grinding and polishing apparatus, and the same motor runs a fan in summer. I connected with this apparatus a small bicycle pump, which pumps air into a reservoir containing ten gallons. This gives me a pressure of ten pounds, which I find is sufficient.

Dr. Freeman.—If Dr. Elliott will go to the Watler Manufacturing Company, he will find the very apparatus which he has described. This apparatus will give fifteen pounds pressure, the cylinder holding ten or fifteen gallons. It may also be used as a suction-pump by reversing.

Dr. Charles Meeker.—I would like to ask Dr. Freeman what brand of hydrogen dioxide he uses and also if he has used hydrozone.

Dr. Freeman.—The hydrogen dioxide which I use is that prepared by the Oakland Chemical Company. I have never used the hydrozone.

The Chairman.—We will now bring the discussion to a close and with thanks to the gentlemen who have so kindly participated. Dr. C. B. Parker, much to our regret, is unable to be with us this evening. He has, however, sent on his paper, and, with your permission, the secretary will read it. I regret exceedingly his absence, as we had hoped to have Dr. Parker's reply to the discussion as well as his paper.

(For Dr. Parker's paper, see page 169.)

DISCUSSION.

G. Lenox Curtis.—An apology seems unnecessary by one able to do conservative surgery as described by Dr. Parker.

My experience in the use of cocaine is confined to hydrochlorate. This I use in varying strength, to suit the case.

I invariably employ its antidote,—volasem,—to guard against any untoward effects. This enables me to proceed with the opera-

tion without loss of time, and the patient to leave my office as soon as the operation is over. I use cocaine in fully ninety per cent. of my operations.

The dentist's manual training, and familiarity with oral work, enables him to operate within the mouth with the bur and engine as readily as the general surgeon operates with the knife and cutting forceps from without. The great advantage of this, as claimed by the author, is the little damage done to the facial expression, for reason of no scarring, small loss of blood, and little injury to the nerves. It also facilitates rapid operating, and, because of the minimum amount of injury to the normal tissues, the time required in the reproductive process is greatly reduced.

If surgeons would familiarize themselves with the use of the engine and this method of operating, I think they would find it a great advantage. I believe surgeons are not justified in cutting through the face to do maxillary operations. Operations through the mouth have been demonstrated for so long a time that every up-to-date surgeon must recognize them. It would, therefore, seem that it is the duty of the surgeon, in event of unfamiliarity with his work, to call in a man like Dr. Parker to assist him. It is now considered no disgrace to admit we do not know everything.

It also seems unjustifiable not to teach the student these conservative methods. Nothing to me seems more crude in surgery than to cut through the face in maxillary operations, such as in the disease of the antrum and resecting the maxilla; and yet how few surgeons there are who consider personal appearance in this work. In Germany it is considered an honor to display facial scars; in America, a misfortune.

I can understand some of the advantages derived from the use of the lead plate, for instance, the retaining of the contour of the face until sufficient bone is formed to support the periosteum, and also checking granulation when complete. However, this method is new to me.

In my article on "Resection and Reproduction of the Maxilla," published in the *INTERNATIONAL DENTAL JOURNAL* of March 19, 1898, I speak of the preservation of the contour of the face, from which I quote the following:

"My method to obtain the best results in the preservation of the contour of the jaw is by retaining the necrosed bone in position until the periosteum has been so strengthened by reproduction as to allow nature's outlines to be maintained, employing it as an inter-

osseous splint. Where it is necessary to remove the bone, I retain the contour of the face by gauze packing, and change from time to time until the bone is sufficiently reproduced to resume its shape.

“Where the destruction of the bone has been great, and the periosteum too weak to retain the jaw in position during the process of reproduction, I use an interdental splint (as employed by Liston over fifty years ago), in which the upper and lower teeth properly occlude.”

This method has been employed by me for a period extending over more than a dozen years.

The Chairman.—As this is a subject which requires more of a surgical knowledge, I have asked Dr. H. Lilienthal, of Mount Sinai Hospital, to be present and discuss Dr. Parker's paper.

Dr. H. Lilienthal.—I have listened with great interest to this paper, which I think is a decidedly important one, since it deals with a class of cases which, as Dr. Curtis has said, certainly have been neglected by the general surgeon. I will admit that, until comparatively recent years, but little attention has been paid to the sometimes frightful disfigurement which follows the removal of the superior maxillary bones.

In the first place as to anæsthesia. I do not think it is exactly fair, although I understand Dr. Curtis's feeling in the matter and do not wish to go outside of Dr. Parker's paper, to judge of the possibilities of local anæsthesia simply from cases of caries or necrosis, for that is only one of the reasons for the removal of the superior maxillary bones. Nature has really removed them, or will do so if we wait long enough, although of course with unsightly deformities.

We must also recognize the fact that when we are not dealing with caries and necrosis, but with neoplasms, it may be necessary to work in a more radical fashion than is done in the beautiful method described by Dr. Parker. For instance, in sarcoma of the superior maxilla, where we have to take away bone, periosteum, nerves, and in some instances the skin as well.

Of course, these are not the cases to which Dr. Parker has referred; nevertheless, I refer to them because I do not think it exactly right that a stomatologist who sees a case of disease of the superior maxilla should immediately jump at the conclusion that the operation is comparatively trifling and that local anæsthesia will suffice. Of course, in cases of caries and necrosis this may be so. It is, therefore, very important to diagnose the case very care-

fully in the beginning to ascertain whether you are really dealing with one of the cases which have been referred to, or whether it is perhaps neoplastic in origin.

I have done considerable general surgery with the aid of local anæsthetics. I have opened the gall-bladder a number of times and removed gallstones. Opened the urinary bladder. Done many operations for hernia. Only recently I resected a costal cartilage and opened the pericardium, removing from fifty to sixty ounces of pus. The patient made a recovery and the operation was done with absolutely no pain. In this case it would have been exceedingly dangerous to have employed a general anæsthesia.

I believe in local anæsthesia, but I think in a resection of the upper jaw, where you have more to do than the removal of a sequestrum or the scraping of a carious cavity, where you have to cut through much soft tissue, as in removing the entire superior maxilla, exposing the eye and orbit, the operation is so horrible that I think a general anæsthetic is absolutely indispensable.

As to local anæsthetics I will make one more remark: There are two drugs besides cocaine which are valuable. They are beta eucain and nirvanin, which latter is a soluble form of orthoform.

The bur was mentioned as being preferable to the chisel in these operations. The reason why the surgeon sticks to the chisel rather than to the forceps or saw is that the chisel makes a clean cut, so where it is necessary that the bone should heal without giving off the smallest quantity even of necrotic tissue, the chisel is the only instrument which is suitable. In the operations described, of course, it does not make so much difference; nevertheless, the use of the chisel should not be forgotten.

The problem of keeping the facial expression anything like what it normally was, is a very complicated one, particularly where the periosteum has been removed and there is no regeneration of bone. There I think the highest skill of the stomatologist comes into play, and I recognize the fact that every man must have his own method. I do not believe any two cases are alike. The tissue in no two instances is alike. I have seen some very beautiful and some very mediocre attempts in this direction. I call attention to the frightful deformity when both superior maxillæ are removed. The difficulties in these cases must be fully ten times as great as when but one side is taken away. I have seen many cases where one superior maxilla has been removed and the facial expression was very good. I have seen only one or two where both have been removed and none where the deformity was not great.

The lead method, as described by Dr. Parker, is very clever ; this splint keeping the granulation in place until healing is well under way. The only difficulty would be where we have no regeneration of bone. Here the cicatricial contraction will continue long after the gauze has been removed. However, this method would suffice in the cases covered by the paper, but some method should be invented for keeping the soft parts up without the use of gauze, which is compressible and allows the deformity to progress. I will say that the only good I have ever seen from an appliance in cases of double resection of the superior maxilla was in the separation of the nasal from the oral cavity. Of course, when both maxillæ are gone the mouth and nose form one huge cavity. An artificial roof of the mouth, here, which will separate the nose from the mouth, will contribute enormously to the patient's health and comfort. I have seen such an appliance made by a dentist. The patient protested because the face was not as beautiful as before the operation, but inasmuch as the dentist did not see her until the cicatricial tissue had formed, he was not to be blamed.

The Chairman.—We are very much obliged to our friend, Dr. Lilienthal. We are disappointed this evening in the absence of Professor Dawbarn, who was to have been present and take part in the discussion, but he informed me that he had overlooked the fact, when he promised to be present, that he had an important faculty meeting for this evening which he had to attend.

There is present with us this evening Dr. Fuller, of Brooklyn, who has seen some of Dr. Parker's operations, and could perhaps tell us further about them.

Dr. D. A. Fuller.—I have seen two or three of the operations, but I do not know that I can say anything more than has been said. I was very much pleased indeed with them, and think them equal to any operations in oral surgery which I have ever seen. I saw the operation, the results of which are shown in the picture, and was very much gratified with everything which occurred in connection with the operation.

The Chairman.—Gentlemen, with your permission, I will endeavor to explain, as Dr. Parker told me, the manner of application of the lead a little more in detail. In applying the lead splint, it is desirable to get some support from the back teeth, and, as Dr. Lilienthal has pointed out, the special advantage of Dr. Parker's method is in just these cases where the whole of the two maxillæ have not been removed, but where the anterior portion has been

removed. Dr. Parker selects some small hollow or pit in the bone left on either side, and to these adjusts a little point of the lead splint; if there be no good catch he makes one. The lead plate is then placed inside the lips, the little points caught in the pits of bone, and the natural elasticity of the lips holds it in place without any further adjustment. The lead is in sheets, about the thickness of thin pasteboard, thick enough to hold, but thin enough so that it is in position, contouring the face as desired. The appliance is then removed and wrapped with two thicknesses of gauze and replaced in position, and as the granulations approach it at the upper edge it is cut away, thus holding out the lips and face during granulation.

Dr. Charles A. Meeker.—I should like to have Dr. Lilienthal explain somewhat more fully about nirvanin. What per cent. solution is used as a local anæsthetic?

Dr. Lilienthal.—I have used nirvanin anywhere from one-half to four per cent. I generally use a two per cent. solution. It is injected hypodermically. The special advantage is that the anæsthesia lasts longer. It does not last so long as orthoform, but longer than cocaine or eucain. With eucain (not beta) I have had one or two disagreeable experiences. One, a case of circumcision, where I did not want to give a general anæsthetic, I injected eucain (not beta) with very disastrous results, necrosis of the skin occurring. With the beta eucain, however, I have never had such an experience, as I have no doubt that if I had used it in this instance the result would have been different. Beta eucain was not then on the market.

Dr. Curtis.—In resection of the upper maxillæ in consequence of necrosis, I would say if an impression of the upper jaw is taken before the operation, a cast run, and an interdental splint made to hold the teeth in position during the process of reproduction, the bone will become attached to the teeth and the teeth will become as useful as ever. The teeth are thus retained in normal position and the contour of the face remains unchanged. This method is also applicable to the lower jaw.

Dr. Lilienthal.—I was referring to cases where there was complete resection of the superior maxillæ. Of course, if there are no teeth we cannot make an interdental splint. I do believe Dr. Curtis is correct where there are any teeth, and he is wise in having his prosthetic appliance made beforehand.

The Chairman.—It is very unfortunate that our paper of the

evening was read instead of being presented by Dr. Parker in person, because there are many things upon which he would have been able to enlighten us in the discussion. If there is nothing further to be said on the subject, we will close the discussion with our thanks to the gentlemen who have come among us and addressed us so ably and scientifically.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor the New York Institute of Stomatology.

The annual meeting of the Institute was held on Tuesday evening, December 5, 1899, at the office of Dr. S. E. Davenport, No. 51 West Forty-seventh Street, New York, Dr. Charles C. Kimball in the chair.

The following officers were elected for the year 1900.

President, E. A. Bogue. *Vice-President*, C. A. Woodward.
Recording Secretary, F. Milton Smith. *Corresponding Secretary*, George A. Wilson. *Treasurer*, J. A. Bishop. *Editor*, F. L. Bogue.
Curator, J. C. Palmer. *Executive Committee*, J. Morgan Howe, C. O. Kimball, S. E. Davenport.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, October 4, 1899, at 6 o'clock.

A paper was read by C. N. Johnson, L.D.S., D.D.S., of Chicago, Ill., entitled "Filling-materials."

(For Dr. Johnson's paper, see page 145.)

DISCUSSION ON DR. JOHNSON'S PAPER.

President Cooke.—Several years ago, one of our members enjoyed a very pleasant time with Dr. Johnson in his office. He told me this evening that was one of the pleasantest recollections he had of his trip to Chicago. I will call upon Dr. Andrews to open the discussion of this subject.

Dr. Andrews.—I remember with pleasure, and I have recalled many times, the pleasant hours I spent with Dr. Johnson in his

office, many years ago, in Chicago, and it is a delightful occasion to me to meet Dr. Johnson and to hear his able paper.

I do not know that there is a great deal to be said on the subject that he has not covered. One point which pleased me was his reference to the use of platinum and gold-foil for filling the anterior teeth. I have used it for a number of years, and I have had much satisfaction resulting from the success of these fillings. You can nearly approximate the color of the teeth with one of the three preparations that are furnished us by the dental dealers, and I can fully indorse all that the essayist has said in favor of these materials.

I wish Dr. Johnson could tell us something about successful cements. I think cement is one of the most difficult things we have to deal with,—finding the proper kind. I have tried all kinds without getting anything that could be relied on. I have been for a great many years an advocate of preparatory fillings in young, frail teeth,—filling such teeth with cement. The teeth seem to be better prepared by such treatment for permanent work. I believe in this preparatory work to-day. I have seen the value of it after an experience of over thirty years. I advocated this treatment before the Massachusetts Dental Society many years ago, and the late Professor Chandler sat down very severely on me. But I had the satisfaction of hearing him some dozen years afterwards advocating this same method. We are on the watch for the coming cement. Every kind that I have tried has its faults. In some cases the cement seemed to do wonderfully good service, almost permanent work. I have known some to last for ten years, and that is exceedingly satisfactory, but the same cement in another mouth may fail in six months. You cannot depend on any cement that I know of. And this is the trouble in regard to inlays, you are never quite sure how long they will remain in spite of the utmost care in fitting your inlay. I have had inlays that did good service for several years; others, which have been put in with care, have loosened within six months. The inlays make very beautiful fillings, but the great trouble is, you cannot depend upon your cement. I can indorse anything he has said about gold.

I think amalgam has a larger claim on our good opinion than Dr. Johnson concedes to it. I regard Dr. Johnson as an excellent authority, but I do believe in a good amalgam filling in the place where it is indicated. I have seen in my own practice amalgam fillings that have stood the test of twenty and thirty years in

the distal portions of the mouth, and I think these have done quite as good service as gold. They do not look as handsome, perhaps, but in places where they are not seen they are very satisfactory. We must use judgment in what we use and how we use it.

Dr. Fillebrown.—I have had the privilege for a number of years of instructing young men, and I have invariably taken the ground that gold was the best all-round filling that we had, and, barring its color, suitable in every way. The matter of conductivity does not count very much against it, because teeth that are normally constructed and not decayed near the pulp will bear all the thermal changes that will come through any conductivity of the gold, and if the cavity is large enough to imperil the pulp, the difficulty can be overcome by laying over it some non-conductor, but not cement, because it is very likely to kill the pulp, no matter what you use for the rest of the filling.

We have one man among us in the city that I remember as long ago as 1869, who took the ground that it was not thermal changes that killed the pulp, and gold was the best metal to come in contact with it. I refer to Dr. N. W. Hawes, and he at that time was placing a few thicknesses of gold-foil in the bottom of the cavity and gently burnishing it down, being very careful to exclude the air and not to put any pressure on the pulp. He claimed that he got the best results in that way,—better than trying to put any other substance over it. I have not thought to ask him what his later experience has been.

I do not think the exposure of gold is particularly objectionable, although I have long recognized the fact, without trying to find a reason for it, that in some mouths it looked well, while in others it was not quite satisfactory, and might be said to appear obtrusive. I think the essayist has given the analysis of that difference to-night. At the same time gold can be used in many cavities in the anterior teeth without any objectionable exposure of the gold. All of us who follow the lines laid down by Dr. Arthur a good many years ago,—trimming the lingual surfaces of the cavity to the lingual aspect instead of to the labial aspect, will put in a filling that will be scarcely noticeable. So long as operators will insist on inserting fillings from the labial aspect, just so long they will make an objectionable exposure of gold. I have always tried to encourage the young men,—and the older ones, too,—by that means to keep the amount of gold that will show down to the smallest possible

point. While Dr. Arthur's methods have been criticised a great deal, in my hands they have proved exceedingly satisfactory, and I have noticed it in our classes, that those students who thoroughly comprehend that idea and most carefully carry it out, are the ones who get the best results aesthetically and physiologically.

I favor the use of platinum and gold. I have a patient for whom I put in a platinum and gold filling in 1875 and 1876, and it is in excellent condition to-day. The objection I had to that was the color, the gold having little effect in lightening up the platinum. Being so favorably impressed with it, I entered into correspondence with manufacturers, telling them what I wanted, and I got one or two samples in answer to this correspondence, which were better than what I had used, but not as satisfactory as I had hoped for, consequently I did not give it the use that I might have otherwise. I was aiming for just the very thing Professor Johnson speaks of.—taking off a little of the gold tint without losing all of its color. I am glad to know that it is made practicable and can now be done.

Some of the remarks of the essayist seemed to be based upon the idea that all gold must be malleted. It was not a positive statement, but by inference from his remark that the reason for not using gold in certain places was that it would not bear malleting. Now, perhaps the gentleman would be surprised if he should go down to the Harvard School, where we have seventy or eighty men at work, and hardly a mallet in use there. We expect every man to have a mallet and to know how to use it, but it is not in one filling out of ten that the mallet is used in making gold fillings, and I venture to say that the fillings will pass muster in most cases. A number of years ago I used to think that if a gold filling was not malleted, it was not good for anything. I have changed my opinion very largely in respect to that, and I now believe that if a man has a set of the new Harvard pluggers (which were gotten up within the last year by the combined wisdom of all the Harvard instructors) and can use them with a tolerable degree of skill, he will be convinced that the mallet's mission has been largely curtailed.

Dr. Eames.—I would like to ask Dr. Fillebrown, when he speaks of not using the mallet, just what he does do? Is it a rubbing motion with the hand pressure, or just a direct push?

Dr. Fillebrown.—In most cases it is hand pressure with serrated points. We do use the smooth points and burnish on, especially in finishing. A series of clinics was given some time ago at which the filling was done altogether by burnishing. It was called the

Shumway-Libby Improved Method. The most of the work is hand pressure, and working the gold cohesively.

Dr. Hamilton.—I like to say a good word for tin and gold. My contour work always commences with tin and gold at the cervical wall. It has been satisfactory there and I was pleased to hear the essayist give it his commendation. I wish every dentist would try it and be convinced of its great value.

President Cooke.—How much do you use of the tin and gold in such cases?

Dr. Hamilton.—I use about one-third up the contour where it will not show. If it is in the bicuspid where a side view comes, I place in one fair layer of the combination of one-half tin and one-half gold.

Dr. Gillett.—In general, the principles laid down by the essayist meet my views so thoroughly that I have little to add. There are three points which I wish to mention.

I wish to express my particular satisfaction with what he had to say in regard to the removal of soft decay from the bottom of cavities. There is such a wide-spread belief in the practicability of leaving decayed dentine at the bottom of the cavity, that to oppose this practice is regarded in many quarters as rank heresy, but I have seen such ill results following it that I believe it a point to be emphasized, that we should be satisfied only with thorough excavation of decayed dentine. I have no sympathy whatever with the statement that it is better to leave it than to expose the pulp. A large majority of such pulps give serious trouble afterward. They are apt to be constantly irritable, even if they do not die in the end. It so often results in having to undo what would otherwise be satisfactory work, and in serious suffering and injury for the patient, that it seems to me we ought to make ourselves plain on that point. I was glad to hear Dr. Johnson take the stand which he did.

One combination which we apparently think better of than they do in Chicago, is that of amalgam and gold. I recognize that there are certain objections to its use. On the other hand, I have had such satisfactory results, in selected cases, that I cannot but think well of it, and as the quality of our amalgam grows better,—and I think it has grown better in the last few years,—my use of that combination has been rather extending than otherwise. I have such fillings on record in satisfactory condition after ten years of service.

What he has said about the harmonizing of the gold and platinum in the features of the brunette, brings forcibly before us one of the valuable points in the use of that combination. It explains to me why I have been particularly well pleased with a certain filling in the mouth of a decided brunette. It has been a constant surprise to me that it looked so well, and this point may be borne in mind with benefit in our future operations.

There is one point which I wish Dr. Fillebrown would make plain or amplify a bit. If I understood him, he said that cement always kills the pulp,—is that your belief?

Dr. Fillebrown.—Almost always. It generally injures it.

Dr. Gillett.—Do you mean in the cases of exposed pulp, or moderately large cavities which come near being exposed,—where do you draw the line?

Dr. Fillebrown.—I think in my case, where the cement is placed very near to the pulp, the pulp is likely to be affected by it.

Dr. Gillett.—Suppose there was a fair layer of sound dentine between it and the pulp?

Dr. Fillebrown.—The pulp would probably stand it in that case.

Dr. Gillett.—That point has been much discussed and in some places the consensus of opinion seems to coincide with that of Dr. Fillebrown. I believe that most exposed pulps die under any filling, and I include in this all those where the decay has actually perforated the pulp chamber, whether the decayed dentine is removed or left by the operator. I am equally pronounced in my belief that the zinc phosphate cements have no ill effects in cavities where the pulp has a reasonably thick covering of sound dentine. During all my professional life it has been my habit to place zinc phosphate under all gold and amalgam fillings when the cavity was deep enough to permit of so doing, and I have yet to meet the case in which I thought the pulp was disturbed by the action of the cement *per se*. It is a matter regarding which there are widely divergent views in the profession, and one which may well have investigation to determine which opinion is right. If either view is the correct one, it is important that its correctness be established.

Dr. Hopkins.—There was one point which the essayist brought out very strongly, and which was referred to later, namely: The matter of leaving decayed dentine under a filling. For my own interest and satisfaction, I filled a number of recently extracted teeth some time ago, in which the nerve was supposed to be nearly

exposed, leaving a small part of the decayed dentine at the bottom of the cavity. The cavity was washed out with carbolic acid and absolute alcohol, and sterilized as completely as any sterilization could be carried in the mouth. I then filled the cavities, and in three weeks removed the fillings and the dentine at the bottom of the cavities and put them in culture tubes to see whether there were any bacteria still living and thriving. In every instance I had cultures, showing that the sterilization such as I had given, and which was as thorough as it could possibly be done in the mouth, had not destroyed the bacteria in that decayed dentine at the bottom of the cavity.

Dr. Andrews.—Were the dead pulps allowed to remain in the teeth?

Dr. Hopkins.—No, the roots of the teeth were sawed off, the pulps removed, and the pulp canals cleansed; the teeth were filled on the root side as well, but the wall between the pulp cavity and the fillings still remained intact,—no absolute exposure.

Dr. Fillebrown.—I would like to say a word explanatory of my statement regarding the action of cements on the teeth. I can only say that my observations, which began in 1869 and have been continuous to 1899, have led me to the conclusion which I have stated here to-night,—that the action of cement in the teeth is injurious, and if it be so near the pulp that it cannot resist those injurious effects, you are liable to have trouble. I once advocated, and should not oppose now, leaving decalcified dentine over the pulp. I have always removed all decayed dentine, but simply decalcified dentine I thought it safe to leave. I have always advocated the removal of all decayed dentine for reasons so succinctly stated by Dr. Gillett, and believe that if the pulp is in danger of exposure by the removal of decayed or disorganized dentine, then the pulp had better be destroyed at once, for it is bound to die anyhow. I am satisfied that a great many pulps die which do not come to our notice, and because the patient does not come to us, we believe that our cement fillings have been successful.

Dr. Andrews.—They die under gold or amalgam at times.

Dr. Fillebrown —Certainly, if you approach near enough to it the pulp is likely to be affected by the presence of any filling, cement, or anything else, and is pretty sure to die; and for that reason I believe that if a tooth is so far decayed that the removal of the decayed and disorganized dentine is going to expose the pulp, it had better be destroyed at once.

Dr. Williams.—One mistake, I think, is generally made in regard to the treatment of decayed teeth with cements, and the disappointments resulting from it are in overlooking the fact that the cement becomes hard, flinty, in the interior of the tooth, where the tissues are all more or less elastic, and the minute pulsations of the pulp rebound against it, producing an irritation. We should first use some antacid like lime-water for the correction of the acid conditions of the cavity, and an antiseptic like creosote used to be one of the most reliable; and we now have a good form of it in gualacol, which is not so strong. We can then proceed with the stopping, taking care to have the material correspond more in density with the density of that portion of the tooth, and the pulsations of the pulp will not be so firmly resisted and cause so much irritation as by the method which is most commonly employed at present, which is to first place in a piece of thin paper and then put the cement on that. The phosphate becomes hard and rocky, and I attribute the death of a great many pulps to that cause. Instead of having some plastic material, which would correspond more with the density of that part of the tooth, I have seen persons who thought it was all right to hammer gold fillings in as hard as possible, and under such treatment it is not remarkable that pulps not nearly exposed would die.

Years ago, when I was a youngster, I devised a treatment for such cases which I called a "preparatory treatment." At that time many were using gutta-percha or Hill's stopping (which was a mixture of gutta-percha and plaster-of-Paris). The idea occurred to me that the oxide of zinc might be used, so I used that as a basis for the plastic. Even then the gutta-percha would have a certain elasticity and expand so as to press against the pulp. A mixture of gutta-percha filling and beeswax made a very yielding material to put into the bottom of the cavity, and I have succeeded in saving a great many teeth that seemed to be very near pulp exposure. One particular case that I remember was a cavity in the mesial surface of a left, upper first molar. I gave it the preservative treatment which I was using at that time, which was to first saturate the cavity with chloride of lime solution (I also used simple *aqua calcis* in some sensitive cases), then perhaps saturate with a slight solution of tannin mixed with a little dilute creosote, some soft material that acted as a sort of a sponge for the antiseptics of the pulp, and over it was placed the mixture of beeswax and gutta-percha. After it had remained there for six months without giving any trouble what-

ever, I removed the stopping and soft material until I came to a substance at the bottom of the cavity that looked like dentine, and as I passed my probe over it I found it hard. Ossification had taken place under that very soft material. A year afterward the same tooth decayed on the distal surface, and when I came to fill the cavity, I found the dentine quite sensitive, showing that the former treatment had been successful. I went on with that treatment at a time when many were filling with gold. One day one of my patients happened to call with a friend on a certain dentist, famous for gold filling, and mentioning my treatment he asked to see one of my preparatory fillings, and said he was surprised that Dr. Williams would put such stuff as that in teeth, and that nothing but gold should be used. In those days dentists did not meet and discuss matters as we do now, and, in fact, they tried to keep secret whatever successful methods they used themselves. Eventually I had occasion to meet the old gentleman, who at that time was using nothing but gold, and in the course of our conversation, I told him that I thought that practice was in the same line with the man who pretended to practice medicine and had only one medicine to cure all diseases. He said that he would not fill a tooth that he could not fill with gold. He selected only those that promised to hold the gold fillings, the others he would take out. I told him that was like the physician who had a reputation of curing all his patients, but the secret of his success was the fact that he selected only those patients who would get well. Finally, in the course of time, I got him to acknowledge that that class of fillings had its uses, and that they were sometimes useful.

I think Dr. Johnson in his very exhaustive paper has given a very good sketch of the various materials in their usefulness. We are handicapped by the lack of a durable cement by which porcelain fillings can be retained permanently. They now seem the most ideal filling for a conspicuous cavity, the inlay style, because there is nothing which more nearly resembles the tooth, and I could never find, with all the metals, gold, and the various combinations with gold, anything which would harmonize in appearance with the tooth so well as the inlay. It was claimed that some of the whitened amalgams would do it, but I do not know how long they remained white.

However successful we may be with any material, we must remember that no one thing is a "cure-all," no one thing is the best in all cases, as Dr. Johnson has suggested. We must try and select

what is best adapted for the particular case in hand, physically as well as surgically and mechanically.

Dr. Andrews.—I remember very well the condition of affairs which Dr. Williams has spoken of in older days. The laboratory was then the dentist's sanctum sanctorum, and one dentist would not think of allowing another into his laboratory. He might get at some of his secrets or find out his methods.

In regard to the treatment of exposed pulps, you must use the judgment I spoke of a little while ago. You must select your patient and select young ones. I have had success with adult patients, but it is seldom wise to attempt it, unless there is a great deal of vigor and health apparent in the patient. One of my earliest cases of treating an exposed pulp was for a student studying with me, and in that case the pulp was clearly exposed, so that it could be seen pulsating. I made an application of lactophosphate of lime, and then inserted an oxychloride filling over that, and two years afterward the filling was all removed, the pulp was covered with secondary dentine and a gold filling was malleted into that cavity by Dr. Weatherbee, at a clinic in Tremont Temple, at a meeting of the Massachusetts Dental Society. That was years ago, and the tooth is alive to-day.

I wish to speak of the use of the Scotch stone in finishing platinum and gold-foil fillings. If you will use it in the final finish of your gold and platinum-foil fillings, you will be surprised to see how near those fillings will approximate the "pearl" that Dr. Johnson has spoken of.

Dr. Johnson.—I do not know that I should take up any more of your time. I was aware that my paper was a long one, and I hurried through with it on that account, but some points have come up in the discussion to which I should like to refer.

Dr. Andrews's plea for a cement which is reliable is something which strikes very near to all of us. I have been earnestly hoping for years that we should finally discover such a material, but I also regret to say that in the light of some recent investigations which have been carried on, relative to the physical properties of cements, I do not believe it possible, with our present knowledge, and in view of the conditions of the month, to secure in the immediate future a material of that nature which we can classify as a permanent filling material. This does not imply that no improvement is being made in our cements; on the contrary, there is a hopeful advance by some of our manufacturers, who are studying the matter scientifically, and we have great promise of a much improved product.

As to the distinction between hand pressure and the mallet in the insertion of gold, I consider it an important subject. Early in my practice I became afraid of the mallet on account of injuries that I saw worked by its use, so for years I used nothing but hand pressure, and I think I accomplished fairly good results. But we must not lose sight of the demonstrated fact, that with a given amount of force, gold may be made denser and harder with the mallet than with the hand, and to-day I feel that I need mallet-force, particularly upon the surfaces of my fillings.

As to the combination of amalgam and gold mentioned by Dr. Gillett, I have seen beautiful results where it has been employed, filling the cervical third with amalgam and finishing with gold, but I have not practised that method myself, because I cannot work amalgam, in connection with gold, to my satisfaction. I cannot mallet gold upon amalgam with the same assurance that I can upon tin and gold. It is a matter of personal preference with me. I can take gold and tin, rolled together, and build the cervical third of a filling in one-half the time that I can with amalgam, and then I can go right on with the rest of the operation at the same sitting, and not be hampered by any doubts as to good union between the combination and the gold which composes the larger part of the filling.

There is one thing that I should like to ask Dr. Fillebrown, and that is, on what basis he is inclined to claim that cements necessarily injure the tooth when in close proximity, I do not mean in actual contact to the pulp? I came down here to Boston to learn something, and mean to carry away all I can. I have heard more or less discussion as to the injurious effects of cements upon the teeth, and I should like to ask the gentleman to what cause he ascribes these effects, is it by reason of some irritant in the fluid of the cement?

Dr. Fillebrown.—I should say that it must be something of that nature. I have observed this fact for many years, and my theory in regard to it is that there is something in the make-up of the cement that is injurious to the pulp.

Dr. Johnson.—I did not know but he might have held the opinion that the arsenic in the cement was working the destruction of the pulp. I have heard the opinion expressed that it was not a safe procedure to put cement in close proximity to the pulp on account of the action of the arsenic contained in the fluid. Now, some tests have been made in Chicago by Dr. Ames which go con-

clusively to prove that there is not enough arsenic, or rather that it is not in such a form, as to cause irritation to the pulp sufficient to bring about its destruction. There are many pulps that will not tolerate cement in their immediate vicinity, even if there is not a direct exposure, while there are others that will not only submit to it, but are actually benefited by it, being thereby stimulated to the production of secondary dentine, and consequently better protected. I believe that question is largely one of locality, which has been referred to this evening by Dr. Gillett. I believe that there are certain localities in which a pulp that is nearly exposed will not live under any filling or treatment that we at present have knowledge of, and I think this question of locality ought to be taken into consideration. It explains to us why it is that men differ so materially in their reports and opinions concerning such cases.

I trust you will pardon me if, in conclusion, I say a few things to you outside of professional topics. This is my first visit to Boston, and I wish to say that I conceive it to be a very great honor to be invited here to-night; and I also wish to thank you for the kind things you have said and for the welcome you have given me.

I have always wished to visit Boston because of the historic interest connected with it. We have some things of interest in Chicago, but we lack an extended history, and I for one miss that very much. I like to look upon the landmarks that go to punctuate the history of our country. I never think of Boston without thinking of Bunker Hill, and the names of the great teachers, Longfellow, Emerson, and Oliver Wendell Holmes. If all is well, this is not my last visit to Boston, and I wish to extend an invitation to you to come to Chicago. We have not the old associations that you have here, but we shall be glad to see you and make you welcome.

Dr. Eames.—I feel personally indebted to Dr. Johnson, our essayist, for coming here to speak to us, and I know that we shall all be glad to have him call upon us in our offices. I take pleasure in moving that we extend our thanks for his most excellent paper, and his visit to us.

Unanimously voted.

HARRY E. CUTTER, D.D.S.,
Editor American Academy of Dental Science.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology was held at the rooms of the Academy, 1731 Chestnut Street, Philadelphia, on the evening of November 28, 1899, the President, Dr. E. C. Kirk, in the chair. A lecture illustrated by lantern slides, upon the subject of "Comparative Odontography," was given by A. H. Thompson, D.D.S.

(For the report of Professor Thompson's lecture, see page 102.)

DISCUSSION.

President.—Gentlemen, this subject is before you. It is a very interesting one. I hope all of you will take part in this discussion, and shall call upon Dr. Pierce to make some remarks, as he has interested himself in this matter for some time.

Dr. C. N. Pierce.—Mr. President: The illustrations have been remarkably interesting, giving us an admirable idea of what we can learn from the screen and the lantern. I think there is nothing that more fully illustrates its advantages for educational purposes. I shall not attempt to add anything to the statements that have been made, but there are some interesting freaks in evolutionary processes that may be mentioned. One was alluded to to-night. That there are deciduous incisors in the herbivora and not permanent incisors is a very remarkable modification of developmental processes. There is the sperm whale, with deciduous and permanent teeth. The great whale, or cachalot, has teeth in embryo which are partly developed and aborted, and as the animal reaches maturity we have those enormous baleen plates attached to the upper jaw for a distance of from ten to fifteen and twenty feet. These are peculiar freaks in nature which are interesting to study, and are hardly explained except by reason of modification of diet. The sperm whale, which lives on animal food, has only the cone-shaped teeth; while the *balæna* live on the smaller aquatic forms which become entangled in the fringes of the plates as the whales swim through the water with the mouth open. Then, another question is, whether the large cusp tooth we find in the herbivora especially is developed from spurs from the cone-shaped tooth, or whether it is the cementing together of a succession of these cone-shaped teeth that has given us the large herbivorous tooth.

If we take, for example, the elephant's tooth, we find a large tooth

protruding from the ramus, and apparently being pushed forward. It is not all developed at once, but the anterior part is pushed forward, then new plates are added to the posterior surface until we get a full normal size. There is an interesting specimen in the Academy of Natural Sciences. Now, is that the manner in which our cone-shaped teeth of the higher mammals originally developed? Were they cones simply cemented together, or were they produced by spurs from the cone-shaped tooth, broadening out the tooth as it became necessary to have a masticating or grinding tooth? These are questions that are worthy of examination, and they offer an unlimited field of study for every young practitioner. To me it has been one of the most interesting studies, and although I have given but little time to it, yet it has added more pleasure to my dental practice than any other subject.

The remarks to-night and the illustrations have been to me intensely interesting, because they have so fully illustrated the changes that have taken place from the simple to the complex tooth, and I thank Dr. Thompson very much, indeed, for the opportunity he has given us of seeing these illustrations and the remarks he has made.

Dr. A. P. Brubaker.—Mr. President: I do not know that I have anything new to say on the subject, except to express my appreciation of the admirable lecture by Dr. Thompson. As the slides, however, were passed before us, a query came into my mind which appears germane to the subject, and which I will ask Dr. Thompson to answer for me. It is well known at the present time that the modern mammalian tooth is a modified descendant of the simple cone-shaped tooth of the reptiles. It is generally believed that the cusps on the molar teeth, at any rate, have been due to differentiation, owing to certain mechanical causes connected with the life of the animal.

Now, the query I have in mind is this: Why the incisor teeth do not present cones, and what have been the forces which have changed the shape of a cone-shaped tooth to that of a chisel-shaped tooth at one period? That is one query that does not seem to me to be in accordance with the ordinary causes which have developed the molar teeth from the simple cone.

Another query which presented itself to my mind was, Is the incisor tooth a degenerated tooth? For instance, in the herbivora, for example the cow, we find that the incisor teeth in the upper jaw have disappeared. Is this lack of development a case of degeneration?

Dr. A. H. Thompson.—I cannot say why it is so. I did not touch upon the matter of evolution of tooth-form because, as Kipling says, "that is another story." I have a series of slides on that subject, which is to me one of the most interesting branches of the study. Why the horse should have upper incisors and the cow should not is something that we do not understand, and yet both subsist upon the same sort of food. The history of the whole story of the evolution of tooth-forms is a very interesting thing. To begin at the beginning, there are two principal theories in regard to the evolution of tooth-form. The Germans have what they call the concrescence theory, in which they hold that the mammalian tooth is formed by the fusion of the single cones of the teeth as found in the reptiles. You know the mammals, as a rule, have fewer teeth than the reptiles, and the concrescence theory of the Germans is that the upper molars are formed by a number of reptilian teeth being fused together to form the wide, masticating molar tooth. The American theory as propounded by Allen, Cope, Osborne, Scott, and others of the American school, defines what is called the "differentiation theory;" that the cusp is the offspring of the cingule which grows on the side of the cone-shaped tooth. Taking the proto-cone, the cusp or cingule is developed on the side of the tooth and becomes in time an additional cusp, so that beginning with the three-coned tooth, which is the primitive type of the molar, we have developed from that the later forms of molars. American paleontologists hold that there is no mistake about it, for the birth of the cusp has been observed. Take, first, the primitive cone-shaped tooth, the proto-cone, we have on the side of this proto-cone developed first small false cingules or cusps, or cones, which are the beginnings of the cusps and represent the first step towards their evolution, so the American paleontologists say we are in at the birth of the cusps. These teeth continue to grow until we have the three cones in a row, then the triangular type of molar which is found in the carnivora, the premolars, in which there is a single-bladed tooth with these three cones. The molars of the seals show the primitive type of these three cones in a row. These are the proto-cone, the meta-cone, and the para-cone of the new nomenclature. I wish our nomenclature were of this simple kind. This tricondont form of tooth is the primitive type of molar. It has so happened that in the evolution of the molar there was a movement of these cones, so the proto-cone moved to the inner side, and we have the original triangular molar to which I called your attention in the premolar of the opos-

sum. We have in the human molar the proto-cone, the mesio-lingual cusp or cone, and the mesio-buccal cusp is the para-cone and the disto-buccal is the meta-cone. That is the primitive triangular molar. Now, in the processes of evolution, a new wing arose on this triangular molar which became the hypo-cone, the fourth cone. The oblique ridge is the remains of the border of the primitive triangular molar. The lower molar is developed in the same way, and these molars pass each other in the triangular form. In some types this remained quite sufficient for the purposes of mastication, but in the process of evolution, when it became necessary that food should be more thoroughly masticated, there came the development of what is called the heel upon the upper molar, by which arose the fourth cone or cusp. This was thrown out and the cone raised on it, extending the masticating power of the tooth, by allowing it to strike in the valley of the lower molar, like a pestle in a mortar. That is the theory of differentiation or evolution of cusps as held by American paleontologists, but the Germans hold to the conerescence theory; and although they have done very beautiful things in the study of embryology, they do not defend this theory. The Americans contend that the cusps were developed by evolution from the cingules that were raised upon the sides of the proto-cone. It is a very beautiful study, but it is a long story, and I shall not go into details.

The incisors were probably produced by the flattening of the cone, to produce a cutting edge by simply spreading out, not by differentiation. In the carnivora, where the cutting function is usurped, the incisors are mere rudiments. The cutting is done with the long-bladed premolars, not by the incisors. In the cow and horse and other herbivorous animals, the incisors have greater development.

Dr. Pierce.—I would like to ask Dr. Thompson if he does not think the mechanical force is somewhat of a factor. We have in the lower jaw a third class lever, with the greatest force applied to the molars and the force as lessened upon the anterior teeth, so that the tooth of the anterior part of the jaw must be a cutting tooth or a cone-shaped tooth to be of any use at all.

Dr. Thompson.—According to Dr. John Ritter, the mechanical force is the element that has produced tooth form. In the carnivora the jaw is much shorter and the muscles are moved forward, so that the force can be applied more directly. Great force is applied to the anterior part of the jaw, or the jaws are shortened, in order to make the cutting-teeth nearer where the force is applied.

Dr. James Truman.—During the lecture I could not help recalling my earlier experiences in teaching. We did not have the lantern and other means of illustrating this subject to our classes. Dr. Pierce, Dr. Darby, and others who had this work to do can appreciate the difference. To me the lecture was very interesting, but I cannot quite comprehend the evolution theories that are extant, or the changes explained by either the concrescence theory or by the building up of the cusps, and why all this should occur through the simple fact of change of diet. For instance, I cannot comprehend why the molar tooth of the herbivora and ruminants have the cement and enamel in such arrangement as to be always rough for the comminution of food. Neither can I understand the change from the cone-shaped tooth of the mammoth to those of the elephant, in which we find the teeth and cones are worn off. Neither can I understand why the teeth of rodents should be made continuous in growth and be worn to a chisel-shaped form. Evolutionary theories do not seem to me to explain anything. Once in discussion with Professor Cope, I asked whether the changes that we notice in the human subject in the supernumerary teeth, for instance, were reversionions of type? This he would not or could not answer. We have there the cone-shaped tooth, and it is a typical tooth. There is no change, and I would like Professor Thompson to say if he can explain that condition of things. That cone-shaped tooth is always of the same character, of the same type. Is it a reversion to the earlier form? Does it belong practically to the human subject? And yet we find it all the way through. It seems to me there is something lacking yet in the theories that undertake to build up cusps by attachments, as Dr. Thompson has delineated on the black-board. I cannot quite comprehend it. Perhaps this is my lack of intelligence. I suppose there never will be the better explanation of the whole topic that some of us would desire. I am an evolutionist to some extent, but I cannot exactly understand the evolutionary theories. I cannot comprehend that the dog should have a tubercular molar posterior to the sectorial tooth because he has changed his food.

Dr. Thompson.—I should like to be able to reply to Dr. Truman, but, as he says, we are still in the dark, and a great many things he would like to know probably we shall never know. We would like to have a great deal more information. Referring to the supernumerary teeth of man, I believe, as he suggests, that they are to a certain extent reversionions; for instance, we know that man has

but thirty-two teeth and the typical mammal has forty-four. Man has in the process of evolution lost twelve teeth. Now these teeth sometimes reappear. Sometimes we have an incisor that is quite typical, quite like the other lateral incisors. Sometimes we have cone-shaped teeth that are almost like canines, come and disappear. Sometimes we have bicuspid teeth that are typical third bicuspid teeth; sometimes we have a fourth molar that appears, in the higher races, appearing as pegged-shaped teeth, mostly on the outside of the jaws. I have reason to believe that these are to a large extent reversions, or sporadic reappearances of dental organs. As to the effect of food upon the development of the jaws and teeth, I think there is no mistake. What you might call food selection has dictated the forms of jaws and teeth, because they are especially adapted to foods, and it must be that the tooth is adapted to the material and not the material to the tooth. I think there is good reason to suppose that it has been developed by the kind of food the animal has used. I wish that I could throw more light on the subject, but, as Dr. Truman well says, "we are still in the dark."

Dr. I. N. Brogmell.—It occurs to me that one factor favoring the question of concrescence may be explained in this way. When we take the matter of the development of the incisors into consideration, we find that they develop from three separate globes or plates along the cutting edge of the tooth. These, in the beginning, are cone-shaped calcified spots, and we have a union of these separate plates in the crown. We really have in the beginning some imperfect cone parts to this tooth. We can also consider that we have two cones in the bicuspid tooth which have become united by concrescence.

Dr. S. H. Guilford.—One of the first papers that Dr. Thompson wrote appeared perhaps twenty or thirty years ago in the *Dental Cosmos*, and was upon the subject of "The Suppression of the Wisdom-Tooth." I would like to know whether, as the years went by, he has found any further facts to confirm him in the belief that the wisdom-tooth should be finally suppressed or eliminated.

Dr. Thompson.—I think that there is every evidence that the wisdom tooth, along with some other disagreeable organs in our anatomy, is being eliminated, and that it may be classed with the appendix vermiciformis and other useless organs.

Dr. Pierce.—Lamarck said a good many years ago that there is a law of nature that had a tendency to produce that shape and structure which give the most efficient service. I think that is true,

and explains the changes that are constantly taking place in the direction of modification of the teeth. There seems to be an effort on the part of nature to produce that structure and shape which will give us the most efficient service. (Replying to Dr. Kirk.) He does not explain how the law acts nor draw attention to the principle back of it.

Dr. Thompson.—I have replied to everything as far as possible as I went along and cannot say anything more. I think the third molar is in process of suppression, *i.e.*, in the process of evolution, and that the upper lateral incisor is following in the same path, because we often have the upper lateral incisor suppressed. It is often deficient in form, and is the most erratic tooth as far as known. I want to thank you very much for the courtesy of your attention, and I hope I have contributed to your entertainment and instruction, but I do not think I have done much of the latter.

Dr. James Truman.—I would like to make a motion. It is not customary to thank our members for giving us valuable papers, but I move a vote of thanks to Dr. Thompson for his valuable lecture. (Carried.)

Editorial.

DENTAL LITERATURE OF THE PAST AND PRESENT.

VERY few, it is surmised, think of comparing the dental literature of to-day with that of fifty years ago; or, as they receive their journals monthly, stop to consider the enormous strides made during a few years in the development of this side of dental labor. That it has more than kept pace with the progress in other directions, does not require enlargement here.

When a cursory view is taken of the dental periodicals published within the memory of many now active in the dental profession, it is evident that those of less than a half century ago were not even on a level with the standard of thought and practice of that period. With perhaps one exception the few existing were simply advertising sheets with a very limited claim to literary ability, and none at all to original or scientific thought.

It may be said, with some show of truth, that dentistry at that

period was too much engaged laying the foundations of a profession to be interested in the solution of literary or scientific problems. While this was then true, it still remains unaccountable that so little was done to build up this better side of professional work in this country. The explanation of this may possibly be found, not in the lack of ability, for that certainly existed, but in the absence of an incentive to work. This came at a later period. The isolation of individuals combined with the feeling that each man must be his own instructor, a feeling that then held supreme mastery of the individual, had much to do with this inaction. Until this was removed, broader thought and more advanced ideas were an impossibility.

It must be evident, as dental history is read, that periodical literature made but slow progress and only grew as associated effort developed. Hence as dental societies became a permanent means of interchanging thought, dental journals remained as they had been, simply as a means to advertise the wares of those responsible for their publication. They contributed little or nothing to the advancement of dentistry, beyond the border-land that exists between trade and profession.

The development of associations was the renaissance of dental literature. With association grew a new development and a demand for better mental pabulum until, at the present time, we find our journals and books worthy the advancement made in other directions. That this change for the better has been mainly due to association, must be conceded. It may be said that the progress noticed would have been accomplished by natural progressive laws, and to some extent this would possibly have been the result; but it is doubtful whether the journals extant to-day could have developed under these existing conditions. The mass of men are rarely moved except by powerful stress, and it was just this want that made those of forty years ago apparently incapable of performing the work that really should have been begun at that period.

When society was added to society, it required an effort of those connected with them to do some original work, and this influence spread. The quiet labor in the laboratory began to be demonstrated on society platforms, and the local, state, and annual gatherings, as these were organized, served to show that here and there a new school of thinkers were being brought to the front. These grew as education advanced in dentistry, and *pari passu*, the character of dental journalism began to assume an altogether different character. Certain portions of it, at present, compare very favorably with the litera-

ture of the older professions, indeed, in some respects, much of the reading matter is in advance in scientific ability. That this will continue proportionately to progress as dental education takes higher ground, needs no argument.

There is still, however, left an unsatisfactory remnant of the old condition. The advertising sheet is yet with us made up of abridged restatements from other journals, which, while they may do some good, exist only by crucifying the original work of writers. It is probably true that these are prone to prolixity, but it is not equally true that editors of trade journals are always the best judges of what a writer should say, or leave unsaid. A recent editorial in one of these sought to excuse this mutilation by assuming that writers used too many words, and, by indirection, intimated it was for their good and that of the readers that the articles were cut down and thus became better adapted to the comprehension of those who read the journal. While it is true that there is a tendency to prolixity, it is assumed that an author is the best judge of what he meant to say and how he should say it. At all events it is not exactly honorable to steal the grain and throw away the so-called straw, for it must be remembered that both are essential in giving life.

While dental periodical literature of this character will always be with us, there is a bright side even here; and this is evidenced by the fact that the supply houses have found it necessary to meet advancing conditions by placing men of intellectual force in control, and this gives a prospect for a better state of things in the future.

The vast difference between now and then, or the present and past, must be apparent in a survey of the contents of the few journals that have risen to a higher level. Instead of a few pages of reading matter, these have expanded from sixty to ninety pages monthly. In place of dull text, this is enlivened by the highest skill of the engraver's art. Every effort is made to give variety in addition to the best thoughts. The criticism has been made that those journals that present the best work do not receive this at first hands, but secure it from various societies. Such a criticism has no force, for this must continue to be the only channel through which original workers seek to give publicity to their labor. An individual who may have spent months in laboratory investigation, or years in clinical observation, naturally desires to meet his colleagues and have their opinion of his work, and this is not only natural, but it is important, for the criticism received furnishes a standard for judgment. Then the paper goes to that larger audience, the readers

of the selected periodical, and receives a wider consideration. In that journal, care is taken that the writer shall not be abridged by a single sentence. Its fate thereafter is left to the conscience of those who republish.

It is useless, perhaps, to speculate as to the number of readers of our present literature. There is no question but the number who carefully read and digest the matter contained in journals, is growing rapidly, and that the large army of dental operators who only read the advertisements are happily growing smaller. The editor who, by his occupation, is forced to read over and over again the matter in his own journal, feels equally constrained to read everything original in his exchanges, and by this continued contact with the best thought becomes, necessarily, better able to judge of the value of that thought and its probable effect on his profession. The reader who fails to follow the paper with the discussion, comprehends only in part the real value of the essay; in fact it frequently occurs that in these discussions matter is brought out worthy a more permanent place in our literature, but, owing to its obscure position, it lies buried beyond hope of resurrection. The close reader of the *INTERNATIONAL DENTAL JOURNAL*, with its eight hundred and more pages yearly, must have been impressed with this fact. It is much to be regretted that so much of value is practically lost. This applies equally to other journals, organs of society work. The fact is apparent, but the remedy is not by any means clear. Something might be done by those giving valuable ideas through "Casual Communications" or "Incidents of Practice," if they would enlarge these into brief papers for publication. The dental world cannot afford to part with a single original idea.

The growth of dental literature of a high order has been more pronounced abroad than in this country. The dental periodicals of Europe are superior to most of those published here, in that they devote their pages to truly scientific work, and do not permit in them any matter that detracts from the dignity of a profession. The English, French, and German journals teem with valuable scientific articles, and the same may, with equal force, be said of other countries and other languages. These, unfortunately, do not always get into English dress. The journals have associated with them, directly or indirectly, the best scientific minds in the dental profession in the several countries, with the result that they are conducted with a dignity commensurate with the work to be accomplished. The "funny man" has no place there and should have none here. As

an evidence of the thoroughness in treating subjects, the October number of the *Osterreichisch-ungarische Vierteljahrsschrift für Zahnheilkunde* (*Austria-Hungary Quarterly Journal of Dentistry*) has an article upon "The So-called Early Extraction of the Sixth-year Molars," and this somewhat over-written theme is illustrated by ninety-seven cuts. This is only one of a number of more or less valuable articles on apparently simple subjects, but all treated in a thoroughly scientific manner. Of these is one by Röse, of Munich, on "Mouth Washes," which contains some original investigations worthy of consideration hereafter.

It is only by a broad examination of the journalism of the dental world that we can arrive at any just comprehension of the progress made in a comparatively few years in dental periodical literature, and he who confines his scope of observation to his own country secures but a contracted idea of its progress and of its value. We must get beyond our insular exclusiveness and egotistic assumption that, unfortunately, leads some minds to believe that there is nothing outside of America that possesses any real value, not only in dentistry, but in other things. If these prejudiced individuals would open their minds to the work that is being done in other fields of dental labor, they might be able to discover that the highest conception of dental journalism is not confined to this country, nor has it been reached here except by two or three periodicals. It is hopeless to expect any marked improvement in dental journals, while a large body of men in our ranks are satisfied with the reading of abstracts and digests. If it be not a sign of partial culture, it is at least an evidence that the dental profession in America, taken as a whole, has not arrived at an intellectual standard enabling them to appreciate their own literature, and until that grade of cultivation be reached, it cannot be expected that the dental literature of the world will receive much consideration.

Domestic Correspondence.

TEMPERING IN GLASS TUBES.

TO THE EDITOR:

SIR,—In the January number of the *INTERNATIONAL DENTAL JOURNAL*, page 48, Dr. Howe, discussing Dr. Palmer's description of the use of Swiss broaches before the New York Institute of Stomatology, October 3, said, "In regard to tempering fine broaches, I would like to call attention to the method invented or devised by Dr. Meriam, who has tempered needles and other fine instruments in glass test-tubes. I have never known of any way by which delicate instruments could be tempered as successfully."

"The description of Dr. Meriam's method was published in connection with a paper on making crowns in the *INTERNATIONAL DENTAL JOURNAL* for March of this year. I would advise all who are interested to read it and try his method."

In a paper on "Methods of Root Canal Filling," published in the September number of the *INTERNATIONAL DENTAL JOURNAL*, 1895, page 539, in describing the tempering of Swiss broaches, I said, "I place a dozen or two of them in a glass tube and draw the temper to a deep blue, over an alcohol lamp or a Bunsen burner. The glass protects them from currents of cold air, allows them to cool slowly, and enables one to see the color of the steel."

This method was original with me, and was in use several years before it was described.

This is a trifling matter, but I am sure both Drs. Howe and Meriam will be glad to have their attention called to the published record.

Yours very truly,

SAFFORD S. PERRY.

NEW YORK, January 29, 1900.

REPLY TO DR. B. S. SCOTT, ON THE USE OF "VOLASEM."

TO THE EDITOR:

SIR,—My attention was recently called to Dr. B. S. Scott's letter in the December issue of your *JOURNAL*, criticising my re-

marks on volasem before the Northeastern Dental Association, as published in your JOURNAL of April last. Dr. Scott's criticism reflects on my integrity, although he excuses himself by saying,— "It is fair to presume that Dr. Curtis has been misquoted in the report of the Association." He then publishes a letter from Dr. Kelley, which seems to substantiate his views. The Association editor failed to send me a copy of my remarks for correction (as agreed upon), consequently the article was a great injustice to me. My remarks were principally answers to questions put to me by members of the Association as fast as I could answer them. The report of the stenographer is a jumble of all the answers without the questions being given, and I have been misquoted badly in several instances, such as where it states that "Dr. Kelley would not for a minute have thought of performing the operation with cocaine alone;" but what I said of the efficacy of volasem was entirely correct, and I can demonstrate the "positive declaration" I made in regard to it. The facts concerning my authority for referring to Dr. Kelley's use of volasem are these: The patient for whom Dr. Kelley operated has long been an intimate friend of my family and a patient of mine. I have performed oral operations for her under cocaine, with and without volasem. Previous to the use of volasem she always experienced its toxic effect. Knowing this, and being unable to be with the patient at the time of the operation as she desired, I wrote to Dr. Kelley, asking him to use the volasem which I sent him. I quote from his letter in reply to mine. "October 17, 1898. It gives me great pleasure to write you that I did an extensive operation on Mrs. ——'s bladder, urethra, and posterior vaginal wall under cocaine. I gave her, also, the antidote you sent, telling her it was from you. She stood the operation very well indeed, and has been doing splendidly ever since." From a letter from her physician, present at the operation, I quote the following: "The condition of her heart was such that any slight strain could be sufficient cause for sudden death. I therefore feared the effect of ether and also the shock of the operation. Dr. Kelley finally decided he could perform the operation without ether by securing local anæsthesia with cocaine. I observed no unpleasant effects from the cocaine." The patient since her recovery has several times told me that it was decided that only one of the three operations could be done at a time, but when it was found she bore the operation so well that the surgeons decided to finish the others under the one anæsthesia. I quote from a letter from the patient, in which she

writes of the operation. "Very soon after swallowing the preferred medicine (volasem) I felt a great relief about my heart and greater courage to endure. After my operation I was not conscious of any deleterious effect from the cocaine."

Any physician who understands the action of cocaine on a heart so weak as this patient should appreciate the value of its antidote as demonstrated here.

G. LENOX CURTIS.

7 WEST FIFTY-EIGHTH STREET, NEW YORK CITY.

Obituary.

MEETING OF AMERICAN GRADUATES AT SYDNEY, NEW SOUTH WALES.

A MEETING of American graduates resident in New South Wales was held at the offices of Dr. E. R. Magnus, Liverpool Street, Sydney, on November 20 last, to express their feeling of esteem in which the late Dr. Bonwill was held amongst them.

Dr. Alfred Burne occupied the chair, and amongst those present were Dr. E. Randolph Magnus, Dr. Frank Magnus, Dr. Carter, Dr. Arthur Cox, Dr. Oscar Davis, Dr. Hinder, Dr. Stanley Rea, Dr. Nathan, Dr. MacTaggart, and others. Apologies were received from many unable to attend, owing to distance and short notice of meeting.

The following resolution was put and carried unanimously:

"That we, American graduates resident in New South Wales, desire to place on record our feeling of the great loss sustained by the dental profession through the untimely death of Dr. W. G. A. Bonwill, whose good work will long live to testify to his great ability, and his name will ever remain a landmark in the history of dentistry. We also desire to express our deep sympathy with those members of his family who are left to mourn their loss."

Dr. Burne in feeling words spoke of the many acts of kindness shown him by the late Dr. Bonwill, and also of the great loss that dentistry had suffered in losing such a skilful dentist, and in conjunction with the late Dr. Garretson, two of the most brilliant lights

in the dental world. He felt that every graduate must well remember the clinics given by the late Doctor, which (speaking personally) will remain ever green in his memory.

Dr. Hinder, in moving the resolution, was unable to express his sympathy in fitting terms for the great loss sustained. Dr. Nathan seconded the resolution. Dr. Arthur Cox, Dr. Stanley Rea, and Dr. E. R. Magnus also spoke of the many personal acts of kindness received from the Doctor.

A vote of thanks to the chairman closed the meeting.

H. TAYLOR,
Honorary Secretary.

Current News.

INTERNATIONAL DENTAL CONGRESS.

The Sub-committee on Transportation has completed arrangements with the well-known tourist firm of Thomas Cook & Sons, 251 Broadway, New York, so that dentists who expect to attend the Congress to be held in Paris, commencing August 8, 1900, may secure for themselves and family steamship and railroad tickets and hotel accommodations at the minimum of expense and trouble.

In making these arrangements the committee have taken into consideration that while some of the delegates may wish to secure only transportation from New York to Paris and back to New York, many delegates will wish to visit other parts of Europe during the summer, and they have planned the following tours to assist such in the selection of a trip that the time at their disposal and their means will suggest.

TOUR 1.

A. From New York by Red Star Line steamer "Friesland" on July 18th for Antwerp, thence rail *via* Brussels to Paris, returning same way to New York. First class passage, providing berth at minimum rate for two-berthed room, \$157.85.

If travelling second class from Antwerp to Paris and return, fare would be \$4.65 less.

By travelling on steamers "Kensington" or "Southwark" of the same line, fare would be reduced.

B. *Via Cherburg* (North German Lloyd service).

From New York by North German Lloyd steamers "Barbarosa" and "Friederich der Grosse," sailing July 12th and 19th, respectively, for Cherburg, thence rail to Paris and return same way (twin screw service only). First class passage, providing berth in room for two persons (minimum rate), \$177.00

C. *Via Cherburg* (Hamburg American Line Service).

From New York by Hamburg American Line steamers "Pennsylvania" and "Pretoria," sailing July 14th and 21st, respectively, to Cherburg, rail to Paris and return *via* Boulogne-sur-mer and Hamburg American steamer (twin screw service) to New York. First class passage, providing minimum fare for berth in room for two persons only, \$184.25.

Lower fares can be obtained if occupying berth in room with two or three occupants.

D. *Via Boulogne-sur-mer* (Holland American Line).

From New York by twin screw steamers "Potsdam," "Staten-dam," and "Rotterdam," sailing July 7, 14, and 28, respectively, to Boulogne-sur-mer, thence rail to Paris and return same way to New York. First class passage, providing minimum fare for berth in room for two passengers, \$163.00

If traveling second class from Boulogne to Paris and return, fare would be \$3.80 less.

Lower fares can be made by leaving on steamer "Sparadum" July 19th.

Tickets can also be arranged *via* Southampton or Liverpool at proportionate fares.

TOUR 2.

To provide hotel accommodation in Paris for two weeks (fourteen days and thirteen nights) at Grand Hotel du Trocadero, carriage drives for three days, including excursion to St. Cloud and Versailles, twenty tickets of admission to Exposition, and transfers to and from railway station to hotel, \$65.00

TOUR 3.

One week's tour to Switzerland from Paris, visiting Lucerne, Interlaken, Thun, Berne, Lausanne, Lake Lemán, Geneva, including hotel accommodation, sight-seeing, etc., second class rail-road, \$50.00.

TOUR 4.

One week's tour from Paris to Mayence, thence steamer on Rhine to Cologne, rail to Amsterdam, The Hague, Rotterdam, Antwerp, Brussels, Harwich, London, including second class railway travel, first class on steamers, hotel coupons (three meals per day with lodging), \$42.50.

Those travelling *via* Cherbourg can return by steamers of same line from Southampton, and so make a short tour from Continent through England in connection.

There is a United States revenue tax of five dollars upon each ticket, regardless of the number of passengers in whose name it may be made out.

Should anyone wish to make a longer tour than any of the foregoing, or one with a different route, Messrs. Cook & Sons have such a large variety of tours already planned that there need be no difficulty in making a selection to suit the taste, means, or the time at the disposal of anyone.

The war in South Africa has caused the withdrawal of many of the English steamships. Passenger accommodations across the Atlantic will be less than usual this summer, while the Paris Exposition is attracting great numbers, so that the committee wish to impress upon delegates the great importance of securing their steamship accommodations at once.

Address all communications regarding steamships, railroads, hotels, etc., to Messrs. Thomas Cook & Sons, 251 Broadway, New York.

A. W. HARLAN,
W. E. GRISWOLD,

W. W. WALKER,
WILLIAM JARVIE, Chairman,
Transportation Committee.

BOARD OF DENTAL EXAMINERS, COMMONWEALTH OF PENNSYLVANIA.

THE Board of Dental Examiners of the State of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburgh, May 8th, 9th, and 10th, and in Philadelphia, June 19th, 20th, and 21st.

Application for examination must be made to Hon. James W. Latta, Secretary of the Dental Council, Harrisburg, Penna.

G. W. KLUMP,
Secretary.

WILLIAMSPORT, PENNA.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY.

A MEETING of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held at 563 Tremont Street, Boston, Wednesday, March 21, 1900, at 9.30 A.M. Examination in Operative Dentistry at 10 o'clock.

Each candidate must come prepared with rubber-dam, gold, and instruments to demonstrate his skill in operative dentistry. Anyone who wishes may bring his patient. So far as possible patients will be furnished.

The theoretic examination will include operative dentistry, prosthetic dentistry, crown- and bridge-work, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, anæsthesia, chemistry, and metallurgy, and will be held at Civil Service Rooms, State House, commencing Thursday, March 22, at 9.30 A.M.

All applications, together with the fee of twenty dollars, must be filed with the secretary of the Board on or before March 14th, as no application for this meeting will be received after that date.

Candidates who have taken an examination, and desire to come before the Board again at this meeting, must notify the secretary as above in order to be registered.

G. E. MITCHELL, D.D.S.,
Secretary.

25 MERRIMACK STREET, HAVERHILL, MASS.

MISSOURI STATE BOARD OF DENTAL EXAMINERS.

OWING to the fact that Section 2, of New Rule 8, adopted by the National Association for Dental Faculties at Niagara Falls, fixes the requirements of entrance into all associated colleges, the same as required by the State Board of Dental Examiners for the State of Missouri, I am frequently asked for an exact copy of the rules of the Missouri Board for conducting preliminary examinations.

To comply with a request so general, you will kindly publish our rule in full on that point. It is as follows:

ARTICLE II.

SECTION I.—All colleges operating in this State must comply with the rules as stated in Article I, of the “Rules for Colleges.” Also with the following demands of this Board, before their graduates will be granted a Board certificate :

(1) Students applying for admission to a dental college in this State, who cannot present a certificate as required by Rule 8, of Article I, shall then submit themselves to an examination as indicated in Rule 2, Article I.¹

(2) These examinations must be conducted by a person appointed by the State Superintendent of Public Instruction, through the Secretary of the Board.

(3) It shall be the duty of the person conducting these examinations to make a verified report to the Dean of the College, giving applicant's full name and average grade made by each applicant, and to the Secretary of each Board a duplicate report with each applicant's examination papers, which shall be kept by the Secretary for a period of four years, subject to inspection at any time.

(4) The average grade of an applicant shall be seventy per cent. before he can be admitted to any dental college in the State of Missouri.

(5) It shall be the duty of the Secretary of this Board to notify the Dean of the colleges, whose applicants have been examined, of those who have made the required grade, and are entitled to enter the college as students in the Freshmen year class.

(6) The Deans of colleges admitting students into the Junior or Senior year classes, must in each case make a verified statement to the Secretary in regard to the qualifications upon which each student was admitted.

(7) All expenses incurred in examination of students must be paid by their respective colleges.

(8) It shall also be the duty of this Board to elect two of its members each year to inspect the dental colleges in this State, and they must make a written report at the May meeting of the Board as to their equipment and teaching qualification.

Any further information as to the details of the examination will be furnished upon application.

S. C. A. RUBY,
Secretary State Board of Missouri.

¹ Rule 2, Article I, sets out the standard of admission,—certificate of entrance into second year high school, etc.

THE
International Dental Journal.

VOL. XXI.

APRIL, 1900.

No. 4

Original Communications.¹

COMMON-SENSE OCCLUSION, OR "BITE."²

BY W. WARRINGTON EVANS, M.D., D.D.S., WASHINGTON, D. C.

THIS subject is one that has been discussed in journals, text-books, and conventions, and yet the majority of dentists are as ignorant of the matter to-day as they were thirty years ago.

While I may not be able to present my method as comprehensively as many would desire,—and it is difficult to do without practical demonstration,—yet I will state that it is not complicated by either mechanism or patents on articulators, and I have nothing to sell. My object is, if possible, to assist my fellows in what is generally considered a difficult matter,—*i.e.*, the construction of artificial dentures.

My results have been highly satisfactory for the last thirty-odd years, during which time I have frequently taken impressions and occlusions within the space of an hour or two, for patients leaving or passing through the city, and sent the finished work to them, feeling assured that the dentures would require no grinding or adjustment, the most conclusive proofs of which have been complimentary letters, enclosing checks.

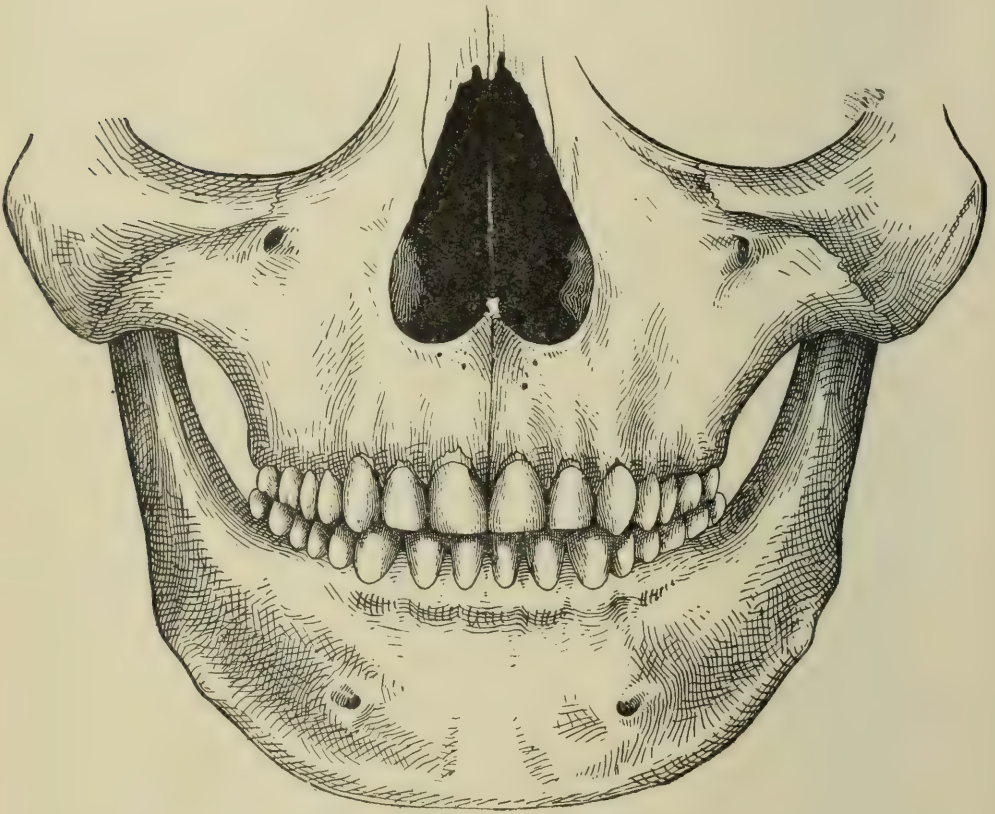
¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claims to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the Academy of Stomatology, December 29, 1899.

I likewise desire to state, in the beginning, that it is not my intention to criticise any other methods that have been presented, or to be especially accurate in my nomenclature, but will reduce the subject to simple language and make it as practical as possible.

A correct *occlusion*, or "bite," as I understand it, is the obtaining the correct distance between the alveoli and the relative position the jaws had occupied, closed normally, before the loss of the natural organs, as shown in Fig. 1.

FIG. 1.



To better understand the importance of accuracy and the difficulties in our way, it may be well to consider in a few words the anatomical relations.

The superior maxilla being fixed, it is not necessary to consider it, but the inferior maxilla, or "mandible," being movable and controlled by both lateral and vertical ligaments and muscles influenced by temperament, causes much trouble and annoyance, and must be met by positive system.

The condyles of the mandible articulate with the anterior portion of the glenoid fossa of the temporal bone, forming the temporo-

maxillary articulation. When the condyles are in normal articulation with the glenoid fossa, then we have a normal occlusion. As in all joints of the human system, here we find the interarticular cartilage covering the fossa and the condyles, to give free motion.

The movements of the mandible are governed by three ligaments and four muscles, as follows: The capsular, speno-maxillary, and the stylo-maxillary ligaments, and the temporal, masseter, internal and external pterygoid muscles. The three first-named muscles, with the ligaments, control the vertical motion, and the external pterygoid gives the lateral or grinding motion to the jaw.

These ligaments and muscles are under no unusual strain when the natural organs are present in the oral cavity and normally occluded. But as soon as the teeth are lost there is naturally an unusual amount of strain on these ligaments and muscles, to maintain the normal temporo-maxillary articulation, thus creating what is known as "jimber jaw" and unnatural protrusion of the mandible. It is with this knowledge before us, and a comprehension of temperamental diagnosis (which also influences the muscular action of the mandible), that we see the necessity for taking time and care to obtain a correct occlusion of the teeth.

Having described the anatomical relations of the mandible, it would be unjust to pass unnoticed the valuable "natural law of the equilateral triangle" of the mandible, discovered and recorded by our late hard-working brother, Dr. W. G. A. Bonwill. His greatest mistake rested in the fact that he believed this law could only be made useful by his articulator, thus preventing a just appreciation of a most valuable discovery.

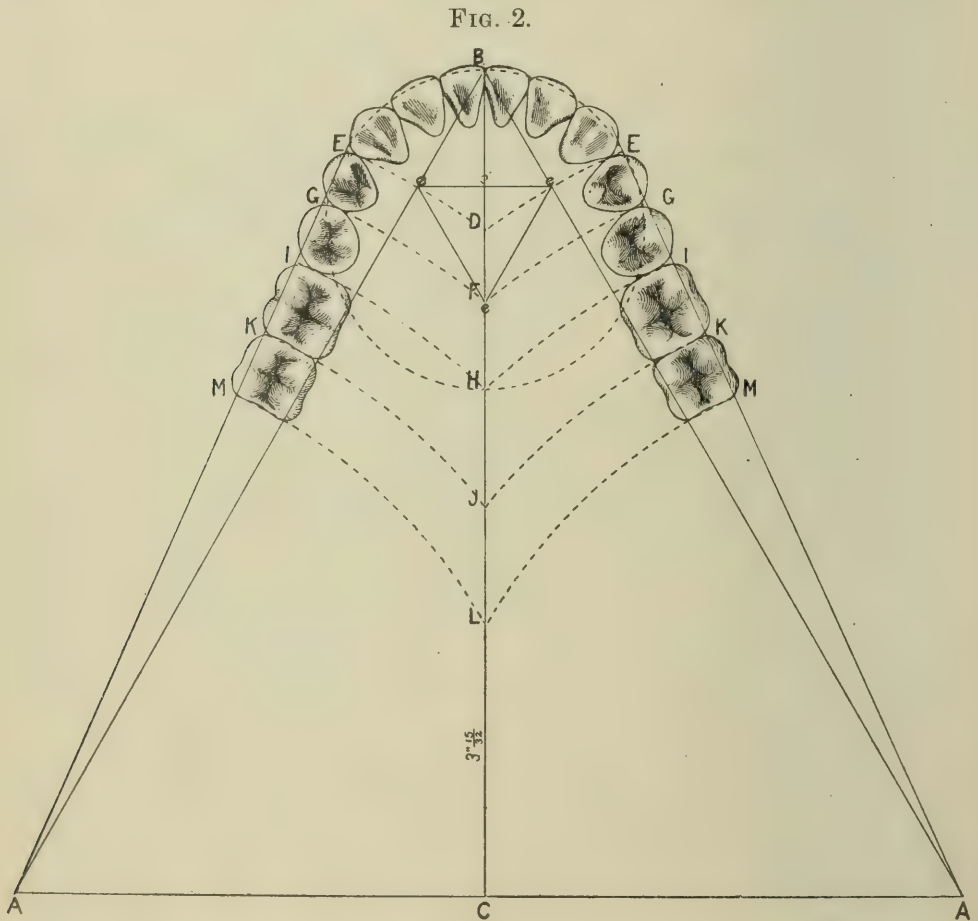
It is only within the past few months that, having taken up this particular subject to endeavor to find the positive, practical merits therein contained, and to see also if it were worthy of consideration for my book, I found through this study much more of value and practical use which could be derived from it than it had credit for heretofore.

The drawings submitted have been prepared with proportional accuracy and with as few lines as possible for intelligent description.

Dr. Bonwill's claim is, "that from the centre of one condyloid process to the other, four inches is the average; and it will be found that from this same centre of the condyloid process to the median line at the point where the inferior centrals touch at the cutting

edge, is also four inches." My own investigations at the government museums as to the measurements, etc., substantially sustain his arguments.

As my object in presenting these drawings of the equilateral triangle is only for the purpose of establishing the normal form of the human maxillæ, I will refer any one who desires a fuller description of Dr. Bonwill's discovery to his last article on the subject, published in the *Items of Interest* for September, 1899.

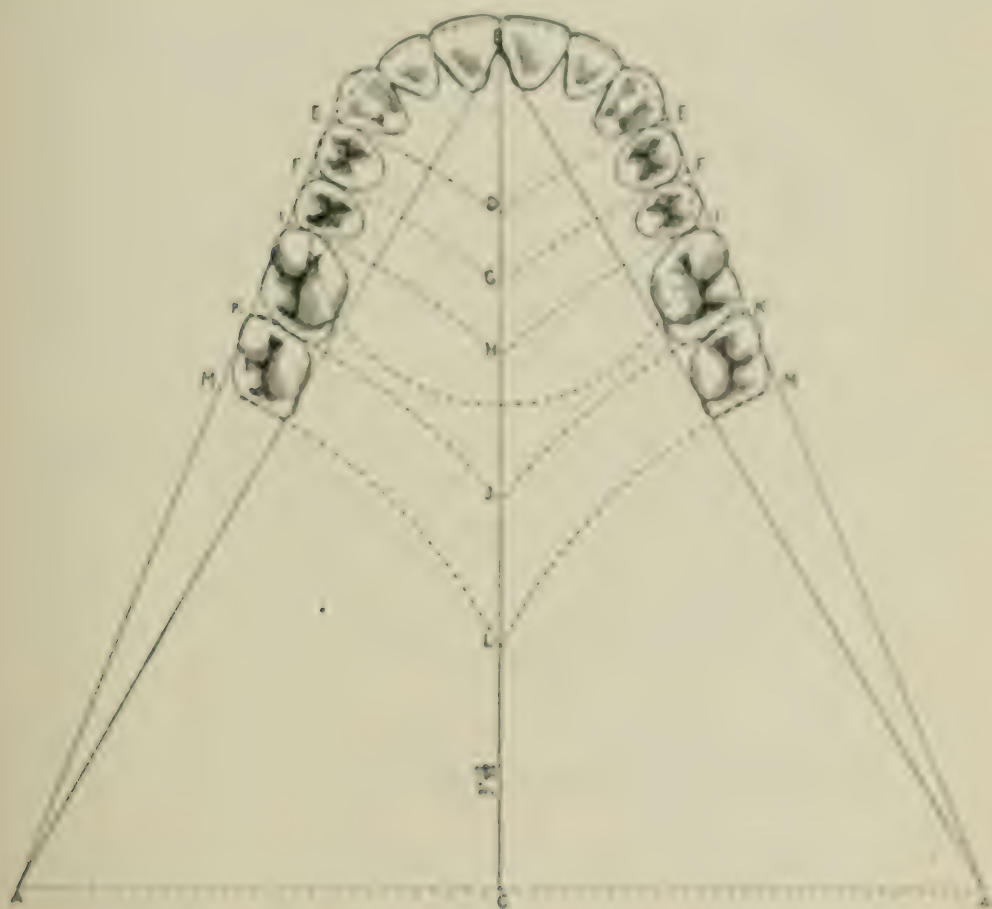


In Fig. 2 we have a representation of the mandible. *A, A*, the supposed centre of the condyloid process, which, when of normal size, we consider at four inches apart; two lines drawn from *A, A* to *B*, of equal length, make the equilateral triangle; from *B* to a point midway between *A, A* gives a middle or vertical line, *C*. By measuring the united diameters of the three inferior front teeth, from the mesial surface of the central incisor to the distal surface of the canine, same side, at the widest point, with a pair of dividers,

and placing one point of the dividers at *B*, the other on the vertical line, at *D*, describe a circle, *D* being the central point. From *A*, *A* describe two arcs of a circle, from *D* to *E*, *E*; these, with the vertical line, will divide the circle into three equal parts. That portion running from *E*, *E* through *B* will be the exact space to be occupied by the six front teeth.

A line drawn from *c* to *c*, and extended down to a point on the vertical line to form a small equilateral triangle, will locate *F*, which will give the size of the first bicuspid, if an arc is described, pivoting at *A*, *A*, from *F* to *G*, *G*.

FIG. 3.



To obtain the size of the second bicuspid, which is larger, place one end of the dividers at *A*, *A*, and describe an arc from *H* (the intersection of the circle with the vertical line) to *I*, *I*.

The space for the first molar is obtained by measuring the distance from *F* to the point on vertical line where it is crossed by the

line from *e* to *e*, and measuring this same distance on vertical line from *H* to *J*; then describe your arc from *J* to *K*, pivoting at *A*.

The distal surface of the second molar is obtained by measuring the same distance on vertical line as from *H* to *J*, establishing *L*. From *L* another arc is described to *M*, pivoting always from *A* or the condyle.

A line should now be drawn from *A* to the anterior distal surface of the canine, which should pass through the buccal cusps of the bicuspid and molars.

The *superior maxilla* differs somewhat in its lines, owing to the larger circle required for the six front teeth and size of the first bicuspid (Fig. 3).

Experimenting for some time, I found that after describing a larger circle, as laid down by Dr. Bonwill, the only reliable guide to obtain the exact size of the first bicuspid was to measure the diameter of the lateral incisor.

This, I discovered, if in a normal condition, always had exactly the same diameter as the first bicuspid. I therefore measured the diameter of the lateral incisor with the dividers, and, placing one point at *E* (Fig. 5), or distal surface of the canine, measured down the line from *E* to *A*, and described an arc from *F* to *G*, pivoting at *A*.

To get the distal surface of the second bicuspid, take the distance from *D* to *G*, and extend down the vertical line to *H*, and describe an arc from *H* to *I*, from the condyle.

The molars are obtained by measuring with dividers from *D* to *H*, and using the same measurements on the vertical line from *H* to *J*, and from *J* to *L*, describing arcs from *J* and *L* to *K* and *M*, pivoting at *A*.

In the superior maxilla, the line from *E* to *A*, instead of running through the buccal cusps of the bicuspid and molars, should barely touch their buccal faces.

While a knowledge of the equilateral triangle is a desirable feature, and of assistance to the dental artist in the arrangement of artificial teeth as substitutes for the natural organs, and to the manufacturer for proper proportioning, it is secondary to the manner of taking a correct occlusion, which it is my main object in this paper to make clear.

It matters little whether the human jaw be established on lines of an equilateral triangle or a trapezoidal square, if the student or

dentist, desiring a perfect occlusion, can derive no practical benefit from these scientific principles, but can rely implicitly, if he have the proper knowledge of manipulation, upon a simple piece of gutta-percha.

To obtain a perfect occlusion, there are *three things* to be considered:

1. A material to make the articulating base-plate with, that will be plastic to work and sufficiently rigid to hold its form when moulded and carved to suit the case, and which will withstand the heat of the mouth without undergoing change.

2. The plate or plates should be so shaped and smoothed as to be light, and to conform as nearly as possible to the finished denture, allowing for length of teeth, but without unnecessary bulk.

3. When satisfied that the bite is correct, find a means to lock the plates, if in an edentulous mouth, so that when removed the perfect occlusion may be retained without disturbance.

If these rules are strictly adhered to, as hereafter described in detail, there will be no need for mechanical articulators, nor will it be necessary to see the patient again until the work is completed, when it may be placed in the mouth without touching with the file or grindstone.

After carefully testing *all* the materials, to find *which* will meet the above requirements, the writer prefers the use of gutta-percha, as having the greatest number of advantages. The difficulties, however, that have been advanced are, that it requires too high a heat to soften it, is too hot to handle, and that it shrinks too much. This is the trouble when first purchased from the manufacturer, but if one will boil it a few minutes, working a little "gutta-percha and wax" compound with it, hammer it out on the anvil, and boil two or three times more, he will make it plastic, comparatively non-shrinkable, and softening at a lower temperature than modelling compound. It will mould like putty. Work up a half-pound until it becomes as described, and by saving the cuttings and adding a new sheet every two or three weeks, to keep up stock and quality, you will always have a sufficient amount of the proper material on hand.

For an upper denture, soften a cake of gutta-percha in hot water, form it into a ball about the size of a small walnut, and lay upon the centre of the model; after having soaked the model to saturation in cold water, work the ball with the thumbs (Fig. 4)

FIG. 4.

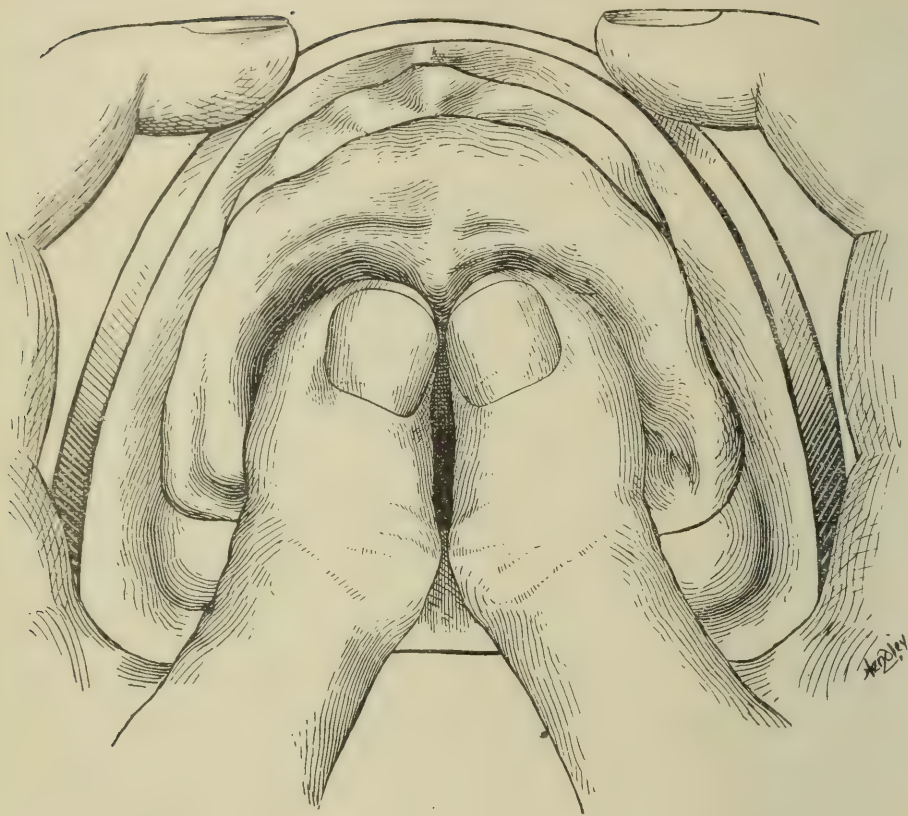


FIG. 5.

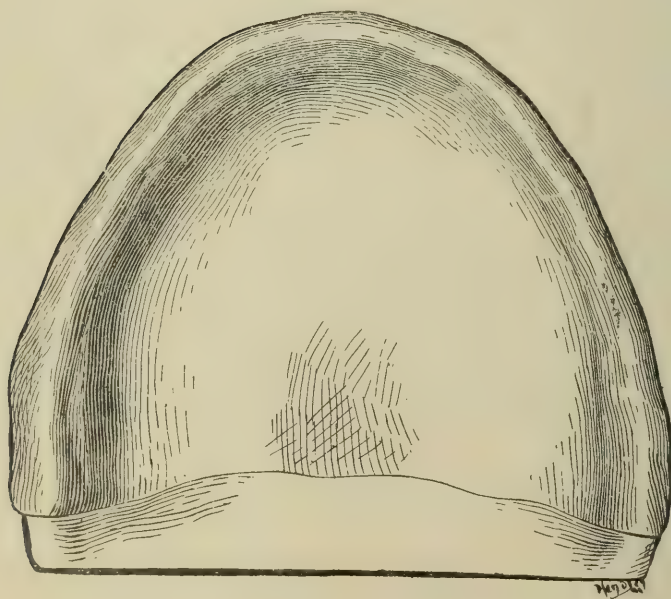


FIG. 6

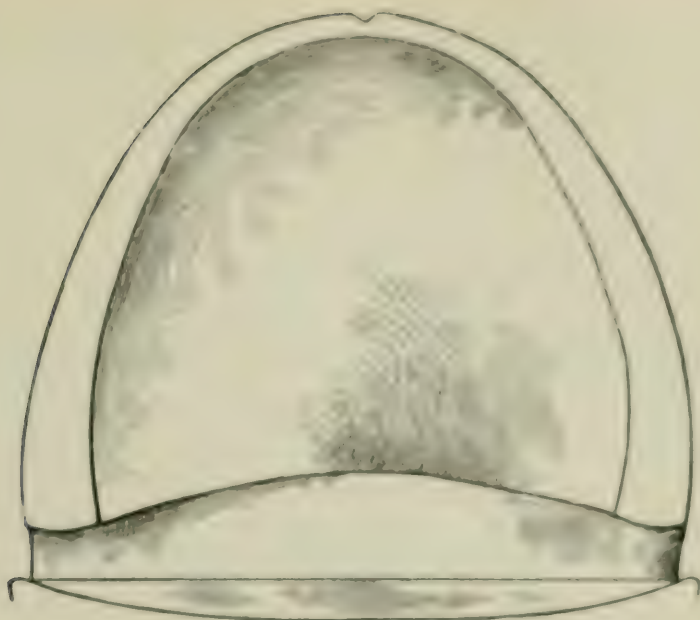
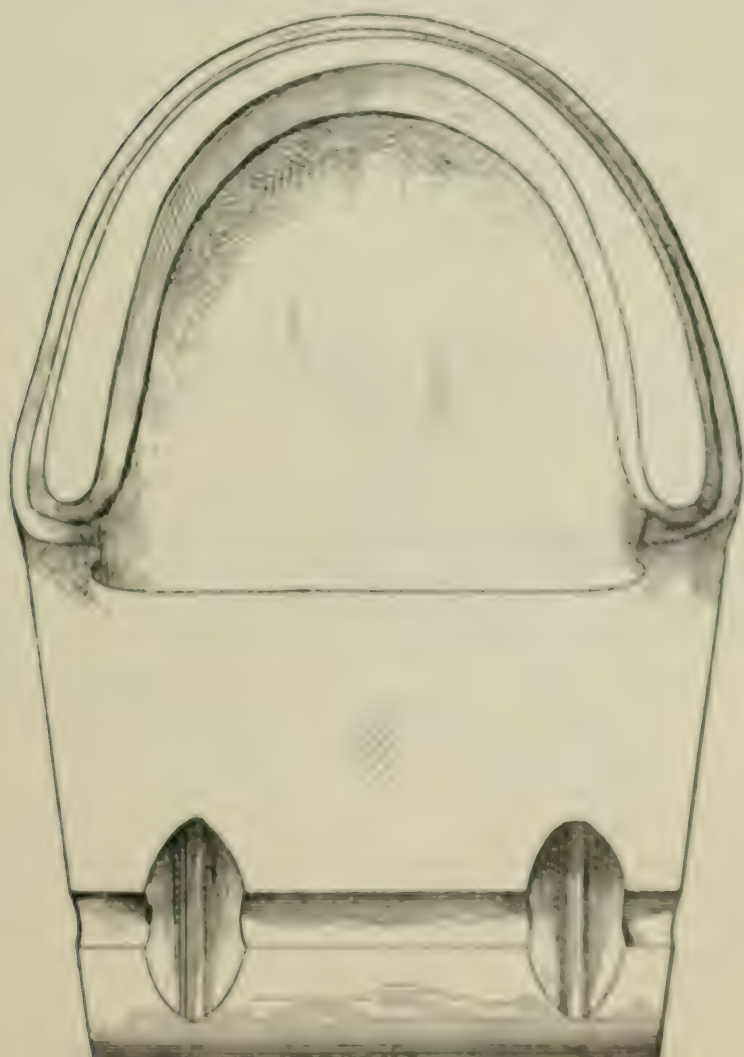


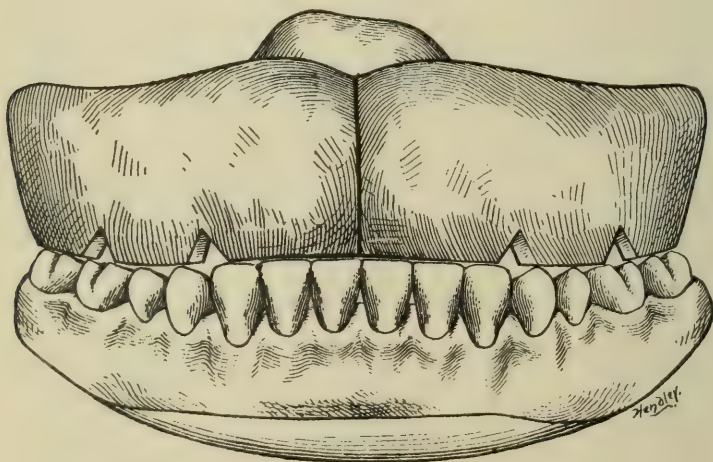
FIG. 7



over the surface of the model, first to a thin edge extending back nearly to the soft palate, next forward and to the sides over the alveolar ridge. Taper as high up over the ridge as you expect to carry the plate labially and under the buccinator muscles, finally working all the surplus perpendicular with the ridge and outer margins of plate front and sides (Fig. 5). Thin the plate well out from the centre. In a word, work this plate to conform in shape as nearly as possible to that expected in the finished plate, and make it thin, especially at the heel. Harden by dipping in cold water, and trim ridge, sides, and edge with penknife, as shown in Figs. 6 and 7. This will give you a base-plate that will fit the mouth, feel natural, and one that will enable you to engage your patient in conversation, thus giving you an opportunity to study the facial expression, which is very important in obtaining a correct occlusion. Tell an anecdote, to make the patient smile, as this is the severest test to an artificial denture. These gutta-percha plates should be so trimmed as to virtually represent the finished denture.

Having trimmed off the biting edge of the ridge to a line of uniform contact all around, and having satisfied yourself as to the proper distance of the jaws from each other, contour of plates, etc., mark the median line on the base-plate, chat with the patient, and examine several times to make sure the marked line comes true each

FIG. 8.



time; then cut some V-shaped notches, as shown in Fig. 8, on the cutting edge, soften a small piece of "dainty" wax in summer, and "gutta-percha and wax" in winter, and when quite soft roll to a rope and lay upon the ridge, pressing sufficiently to fix its

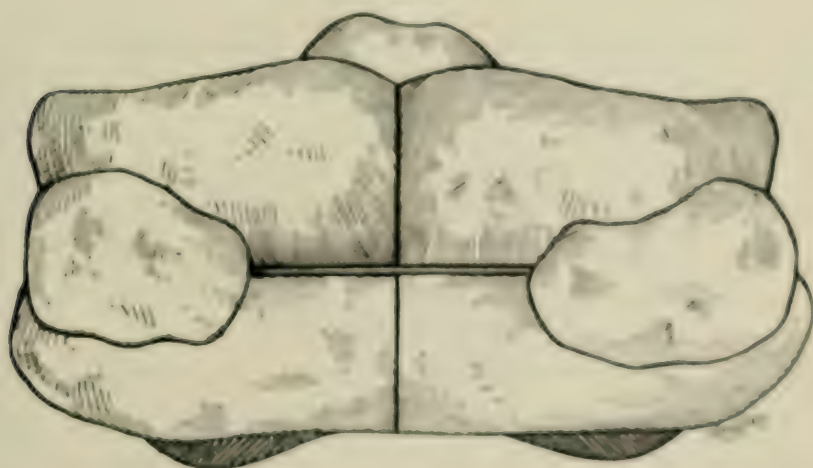
position. Finally, place in the mouth and have patient bite down through the wax to the base-plate, being careful to observe if the mark of the median line is exactly in the same place as before applying the wax (Fig. 9). Gently work the wax to the fronts of

FIG. 9.



the teeth and against the outside of the base-plate while the patient keeps the jaws closed. Should you fail to have the patient close the jaws exactly at the median line, as before the piece of wax was applied, try again until you succeed. You will be well repaid. Never tell your patient to bite naturally; judge that for yourself.

FIG. 10.

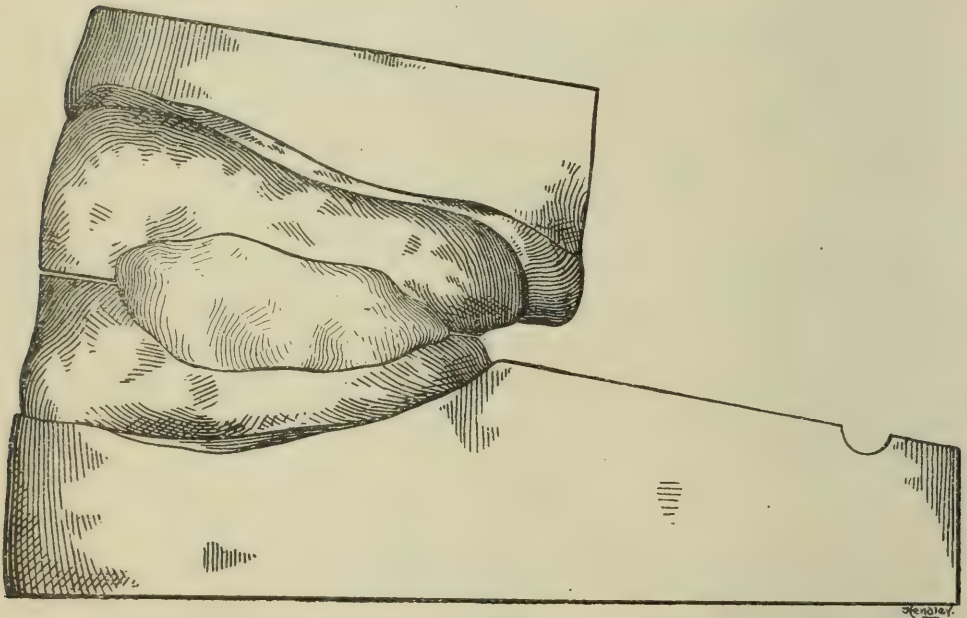


If a full set, make the lower plate in the same way, only work into the soft gutta-percha, while ridging up, a piece of German silver wire of No. 16 wire gauge, to stiffen it. The writer always

keeps several pieces of wire, of different sizes and of horseshoe shape, in his box of gutta-percha for both upper and lower cases. This stiffening with wire enables one to trim the base-plate to a nicety, and at the same time prevents the heat of the mouth from softening it out of shape, particularly in summer.

Having procured the occlusion (Fig. 10), wet the back extension of the model and coat the surface with a solution of ethereal soap, as this makes the simplest and most effective medium for separating articulating models. Replace the gutta-percha upon the model carefully (Fig. 11), wet some soft paper, and pack gently

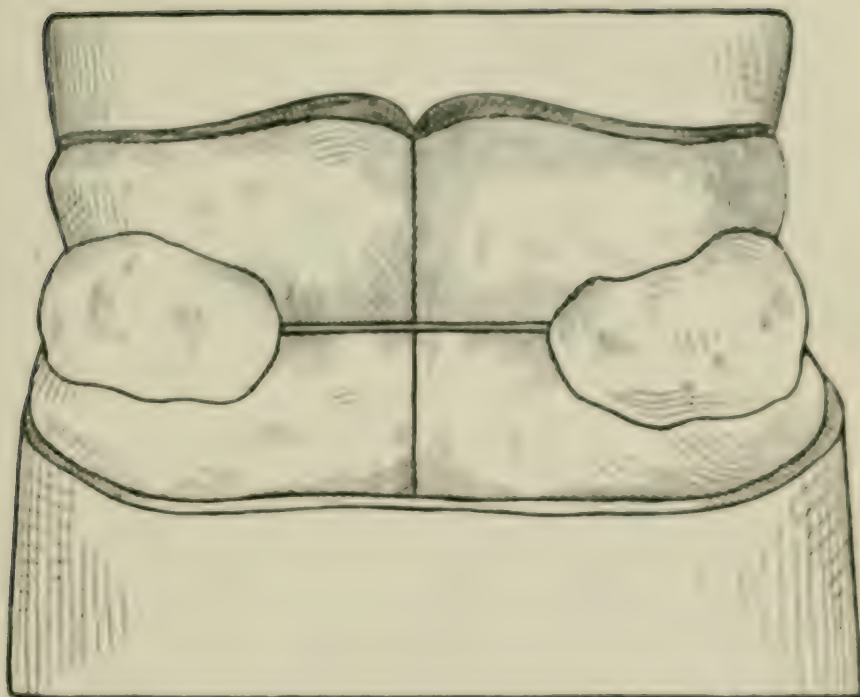
FIG. 11.



into the hollow orifice between the model portion of the plate and the top lines of the bite, the portion that would be occupied by the tongue if in the mouth. This is to prevent the plaster from running into this space and giving trouble. Next, pour the articulating model. Fig. 12 represents a full set occluded by gutta-percha plates before separating; Fig. 13, the articulating models after the plates have been taken off.

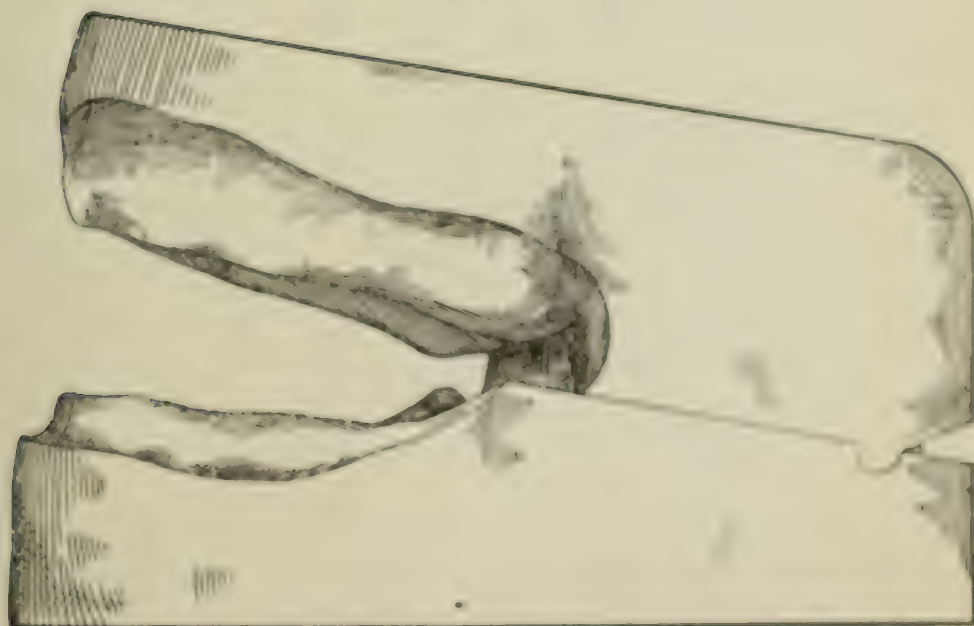
There are those, probably, who may consider the backward extension or plaster articulator an obsolete method. It is old, I admit, but not obsolete, so long as it continues to serve the purpose as well as, if not better than, more modern, complicated, and expensive appliances.

FIG. 12



Mease

FIG. 13

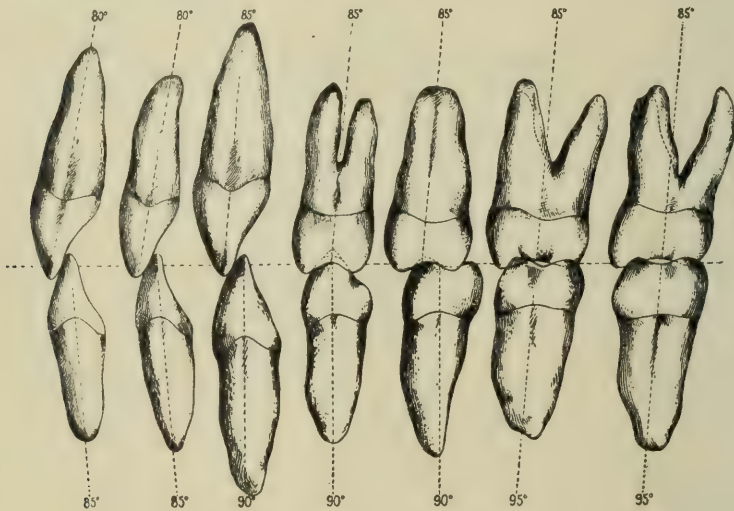


The chief claims are: it is positive in one set position, and there are no screws or bolts to get out of order or be tampered with by an inquisitive friend in a visit to the laboratory.

Your occlusion or bite, as described, if correct, should be so articulated as never to be changed until the work is finished. If it is not correct, no mechanical articulators now constructed will ever make it so perfect as not to require after-grinding or fitting.

A few words more, and I am through; but before closing I desire to present two more illustrations bearing upon the same subject. One is a sectional view (Fig. 14) of what I call normal

FIG. 14.



occlusion, or the line of force considered by degrees, running from a meridian at cutting edge, through crown and root to apex of root. I figure it thus: Upper central incisor, eighty degrees; lower central incisor, eighty-five degrees; upper lateral incisor, eighty degrees; lower lateral incisor, eighty-five degrees; upper canine, eighty-five degrees; lower canine, ninety degrees; the same for the upper and lower first and second bicuspids, while the line of force of the molars is a direct eighty-five degrees running straight through. If in error, I desire to be corrected, as this is only a portion of much more valuable matter.

Finally, in Fig. 15 we have the possible key to the utility of Dr. Bonwill's equilateral triangle. By keeping in our operating-room little tablets, printed in this form, without the dotted circles, we may have a useful means of getting at the correct size or width of

teeth of any mouth we desire to furnish with an artificial denture. If there are teeth in the lower jaw and none in the upper, measure the three lower anterior teeth on one side, allowing for any irregularity, from mesial surface of the central to the distal surface of

FIG. 15.



the canine, with dividers; and describe a circle on tablet diagram. Extend the dividers one-eighth of an inch, and describe the third of a circle, as shown on diagram, and you may rely upon it that any six front teeth which will just fit around this arc of a circle are of the proper size and will suit that particular case. Likewise, in an entirely edentulous mouth, measure with the dividers, seeking a centre that will form a circle touching just outside of the alveolar ridge, in front and on side, at the supposed point just back of the canines, and describe circles on diagram, and you have like result. This a servant can take to a dental depot, or it can be mailed by a country practitioner. This is the practical side of the triangle, to say nothing of its usefulness in setting up teeth, etc., which we have not time now to discuss.

DENTAL NOTES.

BY WILLIAM ROLLINS, BOSTON, MASS.

NOTE V. THE A-W-L ENGINE.

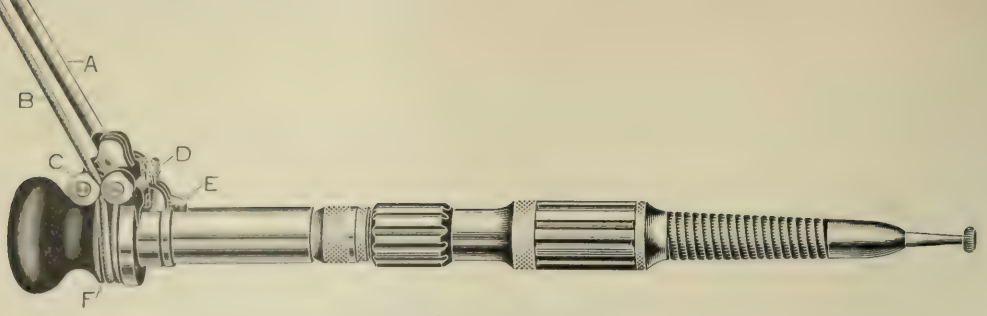
My engine was the first in which a wrist-joint was placed in its normal position, that of suspension from the forearm. Taken in connection with the A-W-L hammer, it is a convenient piece of

mechanism. The half-tone shows its arrangement in repose. The motor is large and slow-running. My patients do not like the jar of rapidly moving grinding wheels, nor rapid blows from the hammer. A thousand revolutions is enough for a bur and six hundred blows a minute enough for a hammer. Less speeds can be had by means of a Berry foot-switch, which has served me, without cost for repairs, during a number of years. No attempt, therefore, is made to show another type of foot-switch, nor is the hand-piece of my design. It was made by my friend, Frank K. Hesse. The engine moves in altitude and azimuth on ball bearings, balancing with a sliding motion. The wrist-joint is interesting for its age and simplicity. I showed the principle in a power-driven engine twenty-five years ago, yet wrist-joints with foolish and unnecessary parts have held the field since. Two things made this joint practical: the rotation of the hand-piece on its long axis and the relative position of the axes of the guides to the axis on which the hand-piece turns on its sustaining arm. The latter prevented the belt from getting tighter when the hand-piece was not at a right angle with the forearm.

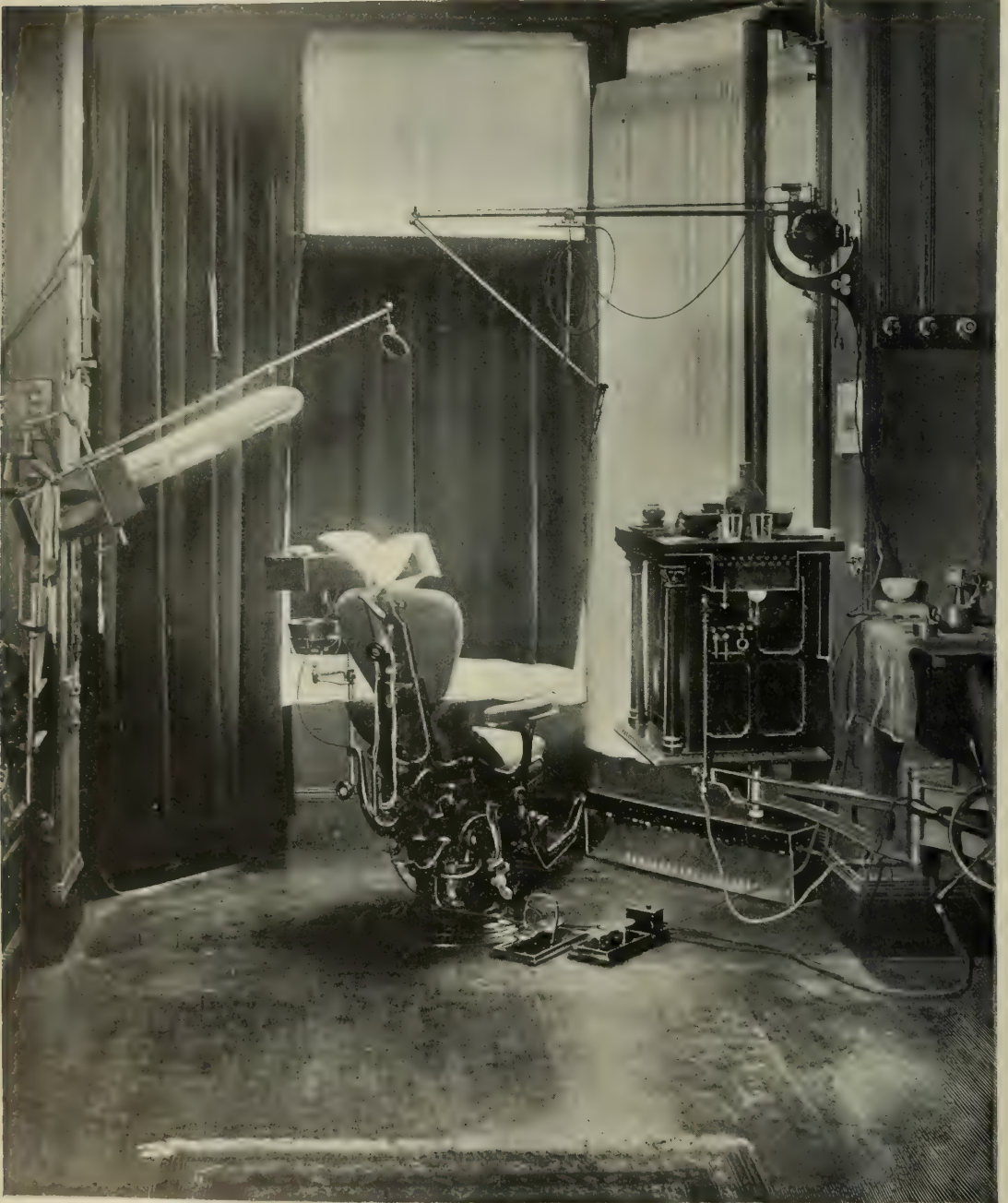
Explanation of the cuts: Fig. 1 gives the general view of the motor end. Either the hammer or the engine can be worked separately by means of the projecting pins. Fig. 2 gives the details of the wrist-joint and lock for the revolving hand-piece.

DESCRIPTION OF FIGURE SHOWING MOTOR AND SUPPORT.

- A, wrought-iron support.
 - B, Holtzer-Cabot one-sixth horse-power motor.
 - C, ball bearings and vaseline cup for lower end of armature shaft.
 - D, iron tube holding horizontal arm.
 - E, balancing sleeve with clamp, F.
 - G, head with ball bearings for movement in vertical arc.
 - H, covers to ball bearings.
 - I, pin for ball bearing for movement in horizontal arc.
 - J, air-pump for hammer.
 - K, wide bearing pulley for crank-pin to hammer. This wide bearing prevents noise.
 - L, bearing pulley for cord to hand-piece. There should be three grooves here for different speeds.
 - M and N, stopping and starting pins to hammer and engine to enable both to go together or either alone.
 - O, vaseline cup.
 - R, rubber tube to hammer.
 - S, cord to hand-piece.
 - T, wires to main and switch.
- Scale 23-84.



Wrist of A-W-L engine.



General view of A-W-L engine and hammer.

DESCRIPTION OF FIGURE OF WRIST JOINT.

A, forearm.

B, cord.

C, guides.

D, release for hand piece.

E, catch holding hand piece and allowing it to revolve.

NOTES ON SILVER NITRATE.¹

BY DR. J. MORGAN HOWE, NEW YORK.

EIGHT years of experience in treating teeth with silver nitrate justifies me in taking a few minutes of this meeting to state with some detail that I think the application of this salt to decaying surfaces is one of the most valuable means at our command for treating that condition.

The late Dr. Stebbins rendered the world a great service when he pursued systematic investigations into the effect of treating teeth with this substance, and gave us the results of his experiments, but the benefits to be thus obtained have not yet been appreciated by many.

I have found special advantages in practice from its use, and will briefly refer to desirable results obtainable by such treatment of certain cases of decay.

In the teeth of children, including not only the deciduous teeth but the permanent molars, decay may be arrested without subjecting the child to pain or distress, and this is often a desideratum to the parent and dentist as well as to the patient. The salt is also valuable in the case of the teeth of all whose conditions or necessities forbid their devoting time or energy to the process of having cavities filled.

I have treated the teeth of invalids in this way, with the result of inhibiting decay for several years, and in some cases have filled the largest cavities after the restoration of health, and have been able to note that no progress had occurred in the decay during the period of ill health.

Patients who must leave home, lacking time to have newly formed decay arrested by filling, may often have such inhibition

¹ Read before the New York Institute of Stomatology, January 2, 1900.

effected by the same means without detriment. And, furthermore, certain buccal, labial, and lingual cavities have been very satisfactorily treated, in the way under consideration, in the mouths of patients irrespective of conditions of age, health, or purse.

In giving the preference to chemical over mechanical treatment, I have had regard to the conditions of decay on the teeth, and to the liability of such chemically discolored places being exposed to view. Decay affecting the buccal surfaces of the molars of young people is often very superficial, but covers considerable surface, has ill-defined borders, and presents unsatisfactory indications for shaping a cavity which would be at all likely to retain a filling and prevent recurrence of decay.

The advantage of chemically arresting decay in such cases is the certainty with which the silver salt acts upon all the disintegrated tissue, whether it is enamel, dentine, or cementum, converting it into a new compound which acts as a protector to the sound tissues under it. In view of the difficulty of deciding just how far to cut away sound tissue in order to include all the decayed, and the large relative amount of normal tissue that must often be sacrificed to form a cavity for filling, I have often found it an undoubted advantage to treat such cases in the manner under consideration.

Perhaps most of the members of our Institute have been practising similarly, and regard these as elementary suggestions, but I claim the excuse that through our proceedings attention may be called anew to this simple means of arresting decay, which is in danger of being overlooked by the rising generation of dentists.

Avoidance of painful, tedious, and expensive operations, with positive arrest of decay for a time, and conservation of a larger amount of normal tissue, are the advantages of this method. They are offset by certain objections, of which are: unsightly discoloration, liability of pulp irritation in deep cavities, irregularity and roughness of treated surfaces; but the advantages greatly preponderate. Next to preventing the inception of dental decay, we must regard a simple and easily applied method of arresting its progress as a means of serving the many classes of people so circumstanced that the preparation and filling of cavities is undesirable or impossible. Such treatment would have special advantages for soldiers, sailors, travellers, invalids, and all persons whose circumstances preclude payment for proper mechanical treatment. Then, too,

there are local conditions, such as I have described, when I think it is only fair that those who are able to pay fees should be allowed the advantages of the treatment indicated.

I have strong hope that this salt of silver will not long remain the only agent possessing the property of acting on decaying tooth-structure so as to form a new stable compound with its organic substance, and so inhibit the destructive process.

I believe that similar properties will be discovered in other substances, without the objectionable discoloring effects, but meantime the use of silver nitrate might be greatly extended with credit to our specialty and with great benefit to humanity.

EDUCATION IN DENTAL MEDICINE.¹

BY HAROLD WILLIAMS, M.D.²

If there is any truth in the saying that no one can be more pleasing than one who is clothed in the mantle of modesty, it seems to me that I should meet with a cordial reception at your hands. I am free to confess that when the flattering request was made me that I should address your distinguished association this evening on the subject of Education in Dental Medicine, I was filled with misgivings. It seemed to me presumptuous that I, who am but new at the business, should ventilate my views before you who are in truth a company of experts,—men who have both incidentally and actually given years of time and thought to this important subject. It seemed to me that I was placing myself in the position of the boy who advises his father about the conduct of his business.

But, after all, there are in this subject of Education in Dental Medicine, as in all other questions, two sides; and if I venture to speak to you on the medical side of the subject, perhaps I may not be so arrogant after all. As an outsider, as it were, at your meeting to-night, it is one of my privileges to congratulate you, gentlemen, upon the advance which the dental profession has made in the past fifty years. When we compare the dentist of to-day, performing his

¹ Read before the American Academy of Dental Sciences (Annual Meeting), November 16, 1899.

² Dean Tufts College Medical and Dental Schools.

painful operations with the aid of his anæsthetics, or preparing a diseased structure with his modern dental engine and filling its cavity after the approved methods at present in vogue, with the dentist of the previous generation extracting molars from his screaming patient with the key, or driving gold into a tooth-cavity with a mallet and tamp, it indeed seems that not only the profession but the patient as well should be fit subjects of congratulation upon the enormous advances which dentistry has made in the previous half-century. And if these matters alluded to are subjects of felicitation, what shall be said of the enormous strides which dentistry has made in the way of preserving the teeth, of the triumphs of orthodontia, or of the seemingly impossible achievements in the nature of crown- and bridge-work! If the Darwinian theory of evolution be true, we shall find the teeth of the coming generations so regular in position and so perfect in structure that the aid of the dentist will not be requisite. Perhaps, indeed, the process of evolution may be carried to such an extent that we shall see the Arctic explorer and Klondyker of the future walking, like the walrus, over the fields of ice by the aid of his teeth!

But if dentistry has advanced so enormously in the past fifty years, so, also, has the study of medicine. Empirical methods are fast disappearing before the exact knowledge which has come to us through the medium of the microscope and the laboratory, and every year sees the profession of medicine becoming more nearly and more surely an exact science. So rapid, indeed, has been the advance in our knowledge, and so widely has the advancement extended, that it has become necessary to increase the course laid down for the student of medicine from three to four years, and even then it is found that those who direct the education of medical students are put to their trumps to find time to teach their pupils all that it is considered requisite that they should know.

With the recent discoveries in bacteriology, in pathology, in chemistry, in physiology, and in the application of these sciences to medicine and to surgery, vast, indeed, are the advances of the medical sciences during the two decades that are past.

Hitherto, Mother Medicine and her dental step-child have walked together. Side by side they have pursued their way, the child sometimes laggingly, to be sure, in the manner that children are wont to do. Side by side they have prosecuted their efforts for the amelioration of the woes of suffering humanity. But the time

is now rapidly bringing them to the parting of the ways, when dentistry is either to be considered as a science,—a special branch, as it were, of medicine,—or when it is to be regarded more in the nature of a highly developed mechanical art. Is it to keep pace with the march of science, or is it to halt and rest by the wayside?

I think I am not departing from the facts of the case when I say that the dental profession of the present day is fast ranging itself in two great bands,—the one which desires to see dentistry practised as an art, and the other which prefers to see it keep step with the modern march of science. In this latter category I desire to enroll myself, and to cast whatever little of influence I may possess. I believe that dentistry should be regarded as a specialty of medicine in a similar manner that the diseases of the eye or the ear are to be so regarded. And it seems to me that the dentist who is called upon to treat a suppurating pulp-cavity must have as complete a knowledge of the nature of the morbid processes which go on in the human body as must the surgeon who is called upon to operate upon a diseased appendix. The disease processes are almost exactly identical in the two cases, differing only in their anatomic relations, and I maintain that no dentist is properly equipped for the practice of his profession whose preliminary training has not qualified him for a true appreciation of the morbid conditions he is called upon to treat. Such knowledge can only come to him from the bacteriological laboratory and the clinic. He must know the life history of the micro-organisms as surely as the surgeon; he must be as thoroughly grounded upon antisepsis and the methods of aseptic surgery as the surgeon himself.

But when I say that I desire to enroll myself among those who believe that dental education should be advanced along the more purely scientific lines of the medical profession, I do not wish to be misunderstood as being one of those advocates who slavishly follow that extension as dictated by some extreme exponents of the doctrine. The present age is the era of election in study, of specialization, and I believe, while extending the line of dental education in the direction of medical science, we should admit of the fullest specialization and individual choice that is consistent with a certain necessary minimum knowledge of the different subjects. Such are my present views. If in the future they should prove to be mistaken, I trust no one will be more liberal than I shall be, or more willing to admit his error.

To consider this matter somewhat further in detail and at the risk of wearing out your patience, I should like to individually allude to the purely scientific branches which enter, at the present time, into the curriculum of a dental school. These branches are anatomy, physiology, chemistry, bacteriology, pathology. Possibly there might also be included theory and practice of general medicine, especially so far as it relates to the etiology and symptomatology of such particular diseases as the dentist is likely to come in contact with. Such a course is now given in our own school, and, it is believed, will prove of value. Taking up these subjects in the order named, general anatomy demands our first consideration. In this study I believe the dental student should receive the same course as that which is laid down for the medical student. The average student in the dental colleges of to-day comes to them with merely a knowledge of books. His only idea or knowledge is book knowledge. His mind is entirely untrained for the study of nature. He has never been taught to learn through the medium of his own special senses. In the first place, therefore, he must be taught how to learn. He must be taught to observe, to discriminate, and to judge, and, having been so taught, he must learn to express this newly acquired knowledge. Above all, he must be taught accuracy, and in anatomy we find a subject most admirably adapted to initiate him into the methods of scientific research. All believe that the dental student should learn the anatomy of the head and neck as an essential to his calling, but without the further knowledge of general anatomy, his knowledge of the head and neck must be, at the best, but incomplete. Much of our knowledge is derived from comparison and analogy, and no person can have a complete knowledge of a part who has not a partial knowledge of the whole. This more complete knowledge of anatomy is, further, to assist him in his comprehension of the physiological problems which he is later to be confronted with; in the physiological phenomena which are, as Harley puts it, the basis upon which the pyramid of medicine is reared. It is also to educate him in the delicate manipulations of dissection and to help him in the education of the fingers, which in the future must become such skilled assistants. But here again the student should be allowed to specialize, and a less exhaustive knowledge of the trunk and extremities should be required of him than is exacted from the student in general medicine. The ideal course in anatomy, it seems to me, should be one in which general

anatomy is required of all students, supplemented by elective courses in each of the special branches.

In physiology we are offering the student a course of study which is to give him in a still higher degree the scientific training so necessary for the prosecution of his profession. Not only is he to learn the methods of the various processes which take place during health in the different portions of the body, the applications of chemistry and physical knowledge to the human body, but also is the development of his intellectual faculties to be further carried on. In this branch is his knowledge of the physical sciences to be greatly extended, and in this direction is much of the future advancement of the profession of dentistry to be looked for. In the laboratory method of teaching at present in vogue he is furthermore to educate his mechanical skill by the construction and manipulation of delicate instruments.

In chemistry the student should learn not only those bare facts which are necessary to him in the practice of his calling, but should enter into the outlying fields of physiological and clinical chemistry. He should learn the chemistry of the fluids of the body,—the saliva, gastric juice, and blood,—and of the processes of fermentation, and he should learn enough to enable him to conduct original research and to become enabled to advance that knowledge which he has received from those who have gone before. In the discovery of anaesthesia one of the greatest advancements of the century has come to us through a member of the dental profession. Is it chimerical to hope that with the opportunities at their command some dentist of the future will give us a practical method of local anaesthesia?

Pathology, again, is a study which must be widely extended in the dental curriculum. Not only has the present knowledge of dental pathology been far outdistanced in the advance of science; not only is it absolutely necessary for the dental practitioner to be thoroughly grounded in the laws of general pathology, but also it is needful that he should know something at least of such special pathology as is necessary for him for his own self-protection and the protection of his patients. And if the dentist of to-day were better acquainted with such pathological processes as I have indicated, I venture to assert that the longevity of the profession would be greatly increased.

In bacteriology the student is to learn the life history of those

micro-organisms which have come to play so important a part in the study of disease; he is to learn the causes of disease and the method of preventing those causes; he is to learn that in the carious tooth of the child may lurk a poison no less deadly than that which is to be found in the hollow fang of the serpent. In this wonderful study he is to learn the exactitude of science and scientific methods in their highest expression and to prepare himself for the practice of his profession upon its very highest plane. I wonder how many dentists of the present day have ever seen the germs—the underlying causes—of the diseases which they treat. How many of them are familiar with Koch's laws for demonstrating the specific relations between a bacterium and a disease? And if the modern dental student has not studied these causative factors, is it not obvious that he is carrying on his study from the wrong end?

It is only through the study of these scientific branches, it seems to me, that dentistry is to advance, that the intellectual faculties of the dentist of the future are to be so developed that he can offer to his patient the trained judgment of the scientist instead of the rule-o'-thumb empiricism of the mere mechanic. But I do not wish to be here understood to underrate the value of this same mechanical deftness which is essential in the practice of dentistry. On the contrary, no one could be more keenly appreciative than I am of the necessity of such skill or of the extraordinary perfection attained by members of your profession. I have seen work performed by dentists which to me seems simply phenomenal. Almost impossible mechanical achievements have been accomplished by members of your profession, and in admiring the extraordinary mechanical perfection of some of your brethren I have almost wished that man might, like the narwhal, be possessed of teeth nine feet in length and with pulp cavities throughout their entire extent, so marvelous was their handiwork.

Between the mechanical and the scientific lies the golden mean. With the faculties of our dental schools composed of the advocates of the two systems, it seems to me that the bark of dental education may be safely steered. At the same time I believe, with Montaigne, that "Habit is a violent and treacherous schoolmistress," and am convinced that the trend of dental education must be upward and onward, and that four years must be devoted to the study of dental medicine if the American dentist is to maintain his present prestige as the most accomplished in the world.

DENTISTRY IS TO THE EYE THAT SEES IT AS TO
THAT EYE IT SEEMS TO BE.¹

BY DR. A. J. FLANAGAN, SPRINGFIELD, MASS.

WHEN the printed notice of this meeting was received by the members of the Institute, and they had read as far as the title of this paper, peculiar thoughts may have emanated from their minds. It is possible that some of those thoughts would not be pleasant, if made audible, and probable that they would not care to repeat them anyway—even to me. My mind travels back a little more than a decade to the city of Philadelphia, and methinks I hear the pleasant voice of good Dr. Garretson saying, “A thing is to the eye that sees it as to that eye it seems to be.” Some of my listeners may have had the good fortune to have passed days of studentship under the guidance of the professor; to those this saying will recall the fact that he seldom lectured on any subject without incorporating into it a certain amount of philosophy. The writer has taken the liberty of changing this quotation to suit his fancy. When one cogitates on this, he has come to the conclusion that it is a most apropos title, giving him many strong forts to retire behind in case of controversy. You know there are many abnormal conditions of the eye, and if a person has a myopic, amblyopic, or astigmatic eye his view of dentistry may still be an honest one, even if judged erroneous by others. By the time the last word of this paper is voiced you may have decided that my view must have been through green “goggles.”

In summing up the true estimate of any profession or calling, there is one question that should always be asked: What has it done for philanthropy? Philanthropy can justly be said to be love of mankind, and love of mankind is charity. You may ask, What is *true* charity? True charity is that priceless gem by God affixed in the human soul, to measure man's allegiance to the highest and holiest laws of heaven,—that by which the world is made akin. Go where we may in this broad land, we find evidence of charity freely given by medicine. You of the metropolis hear and see its good work almost daily. You see men and women of the highest attainments in medicine and surgery giving freely of their time and pro-

¹ Read before The New York Institute of Stomatology, January 2, 1900.

ficiency without pecuniary reward. Perchance you glance your eye down the list of hospital and dispensary staffs: you will find the names of the foremost men in their calling serving there. Now what of our beloved dentistry? We all must admit that dentistry in certain forms is a necessity, and not a luxury; the poor as well as the rich should have its best efforts. After a thorough investigation of this subject, I have yet to find one dental institution or association dispensing true charity. True it is that we have many so-called "college clinics," but it is fair to presume that these cannot be called charitable dental institutions. If we did admit that these were such, how about the staff of operators? Would a medical student be allowed to represent the good charity of medicine? At these dental clinics we see hundreds of dental students operating, but none of the foremost men in that vocation. True it is that the conditions governing medical work are far different from what they would be in dentistry, yet it behooves us to solve this problem. "To whom much is given much is expected." When the epitaph of dentistry is written, may we see emblazoned in lasting device that which is emblematic of charity.

At the present time there is just criticism of our vocation in this one respect. Where there is plenty, charity is a duty, not a courtesy; it is a tribute imposed upon us by heaven, and he is not a good subject who refuses to pay it.

A well-equipped hospital, well managed, is a blessing in any community; you will agree with me when I state that their value to your city has never been justly estimated. What is true of New York City is equally true in a degree of smaller places of residence.

On the staffs of these various institutions are the names of many specialties, save one,—that of stomatology. If its members accomplish good results in every-day practice, why not also in hospitals? Fractures of the maxillæ are considered by many surgeons as difficult to treat. Surgeons of repute are still using the peculiar method, and in extreme cases wire the broken parts. It might be well to state that wiring usually causes a disfigurement. It is my frank opinion that all such cases demand the services of an ingenious dentist. The various forms of interdental splints, correctly applied, always accomplish positive results. Are there not cases where an obturator does greater benefit than an operation for cleft palate? Much is sometimes promised by a surgeon, after an operation of this character, and yet the years only prove it a failure. It is not

uncommon to see the use of the hand-drill, chisel, and mallet in cases of oral surgery. It requires a trained hand to rightly use the surgical engine. Such being admitted a fact, and other requirements equal, the hand trained daily in the use of the dental engine should guide the surgical one to success.

In operations of diseased bony structure, how necessary it is to have a fine sense of touch, which can discriminate between normal and abnormal structure. Could certain forms of dyspepsia have their origin in imperfect mastication of food? If this be a fact, what of the people who cannot masticate at all? What more common trouble than that which is ordinarily called facial neuralgia? The fifth pair of nerves has many ramifications, and frequently an obscure source can be traced to a tooth. In a similar case, would it be honest treatment to administer drugs for alleviation?

In lesions of a dental nature why not the services of the specialist? To my mind there is no greater and surer road to a higher appreciation of our calling than by the *entrée* to the hospitals. "By their fruits shall ye know them," is a good biblical saying, and fully as true to-day as in the past.

Apropos to these thoughts is the good we may do for the army and navy. The powers that be firmly maintain that the oral organs of the candidate soldier or sailor shall be in a certain acceptable condition. Such being the case, is it not rather strange that Uncle Sam does not keep them in that condition? It has been my pleasure to meet many men who have been in our government's service, and invariably the men in the lower ranks have had little dental service, other than extraction. The officers have opportunities and privileges in securing dental service. It is not uncommon for them to absent themselves for days to secure the desired service. We have sadly neglected our museum at Washington, and we have thus missed opportunities to present in a tangible form what dentistry has done and is doing for humanity.

In a conversation had with Dr. Donnally, of Washington, he voiced the thought that this neglect might be one of the reasons why we did not secure the desired recognition at the capital. Up to last August there was not even an interdental splint there. Let us demonstrate our ability to do something besides extracting, filling, and inserting teeth; then we may have the desired assistance from the medical fraternity. As our good work goes on, may we bring to use all science and knowledge that will help mankind. Edura-

tion is but a training of our faculties for a higher and nobler use. Remember that that advancement which ripens but the fruit of individual and class attainment will surely decay and pass back to its elements, selfishness and narrowness.

The *esprit de corps* of any profession has one common source: like unto the ray of light, it starts from a common point, but so diverges that it passes into space, refining and gilding all in an ever-increasing area. Hidden from the eye, within each and every one, is a source of truth for all true advancement; its rays equally brighten and purify all on whom they fall. Can we not call that source ethics?

Abstracts and Translations.

ON THE RÔLE OF SYSTEMIC HYPERACIDITY, AND OF SULPHOCYANIDES IN THE SALIVA, IN CHEMICAL ABRASION OF THE TEETH.¹

BY M. MICHAELS.²

THE morbid origin and development of the chronic diseases grouped under the general name of the rheumatic diathesis many speculations have arisen to explain. While certain medical authorities deny the existence of the diathesis, others, in agreement with biological chemists, consider its recognition of peculiar value. According to these, it is distinguished both by a peculiar condition of impaired nutritive processes and by excessive acidity of the fluids of the body.³

The injurious matters which saturate the blood plasma, as the

¹ Paper read before the National Dental Congress of France, at the session at Nancy, August, 1898. Translated for The New York Institute of Stomatology by Drs. E. A. Bogue and C. O. Kimball, New York City.

² Honorary President of the National Dental Congress.

³ Variations in acidity in the blood plasma have been studied indirectly through the urine by Gautrelet (Urines, Dépôts, Séd, etc., 1889); they have also, by Dr. R. Drouin, been directly demonstrated by analysis of the blood (Hemoalcalimetric, etc., 1893).

result of organic acidity, determine a special dyscrasia which affects all the organs and all the tissues, all secretions and excretions; hence the characters of this diathesis vary infinitely in their manifestations.

The phenomena of the chemistry of life expressed in the functions of physiological health are very complicated, and rest upon an equilibrium in biochemical reactions which is essentially unstable. The assimilation of food and the destruction of the body-cells, the chemistry of oxidation, of hydration, of combinations and resolutions,—all these at every moment are producing new changes and exchanges. If a disturbing influence enter any group of these chemical processes, disorder follows in others; of various kinds, but all betraying their presence in disease, according to the intensity of the process involved.

Gautrelet, in his book on urinary sediments and calculi and the application of urinary analysis to medical diagnosis, gives the following definition of diathesis:

"Careful study of the renal dialytic function demonstrates that the chemical reactions of the organism, to be normal, must take place in an environment,—that is, the blood serum, which contains salts acid in form and yet is alkaline in its reaction. On the other hand, the investigations of Duchaux have shown,—

"1. That alkalinity favors organic oxidation, while acidity retards it; and

"2. That all organic exchanges, in their last analysis, may be compared to fermentations, in which a variety of external substances, notably sodium chloride, will produce a diminution in their activity.

"Now, in chronic diseases, to keep watch of the changes in the blood plasma, noting both its variations in reaction and its variations from the normal percentage of its contained sodium chloride, this will be, we believe, to study the diathesis itself; for it will be an investigation of the essential factor in the morbid conditions,—that is, the departure from chemically normal blood.

"The urine, produced by cell-dialysis, reflects exactly the variations in the percentage contents of the blood, and to follow these step by step will be to obtain a really accurate conception of diatheses; which, according to the above suggestions, should be classified as,—

"1. Diathesis due to increased organic acidity; and

“ 2. Diathesis due to lessened organic acidity.¹ ”

Expressed graphically, it is evident that a certain number of chronic diseases have this quality in common,—that there is an increase in the acidity of the urine.²

These maladies are grouped by Gautrelet under the general heading of the hyperacid diatheses;³ and to demonstrate the causal relation of organic hyperacidity and its various manifestations, he describes the modifying influences of this biochemical acidity upon the derivatives of the blood plasma,—that is, upon the bodily secretions and excretions and the general chemical reactions of the organisms.

In the studies and observations which I have made of patients suffering from organic hyperacidity, I have invariably found the urine pathologically altered in a characteristic manner.

The elements which enter into the formation of urine as integral parts of it occur regularly in well-defined quantities and percentages, and any increase in the acidity of the fluid characterizes one form of diathesis; but the urinary elements in minute percentage characterize merely a tendency towards a particular diathesis. We may, therefore, draw conclusions as to the preparatory stages of a diathesis according as these urinary elements vary in their percentages, and according as we note the manifold abnormal evidences which

¹ Diminished acidity is a constant expression of physiological suffering. (Lallier.)

² The normal reaction of urine is more or less acid, and this acidity depends upon the contained acid phosphate of sodium. But the free organic acids should not be overlooked, especially lactic acid (derived from the muscles), which is at times present in considerable quantity. Other organic acids found in the urine are oxalic, hippuric, and phospho-glycerin. Carbonic acid adds to the general effect, though in less degree. This is Bouchard's conclusion from his study of the acid dyscrasias. How the urine can be acid when derived from an alkaline blood plasma we explain by supposing that the animal membranes, in dialyzing saline substances, allow more acid than basic salts to pass through. This has been verified for acid sodium phosphate. But why do not the other secretions of the economy become acid? Why can we not say that the acidity of urine appears only in the kidney because only there do its elements meet and unite, and that under the influence of their mixing there are formed, in the exchange of acids and bases, acid salts which do not pre-exist in this form in the blood? (Vieillard, *L'Urine Humaine*, p. 166.)

³ Bouchard's valuable studies of the acid dyscrasias are of great assistance in the precise diagnosis of affections of the mouth and teeth in various conditions and diatheses.

may have but an indefinite relation to either the general or the special bodily condition.

The morbid chemistry of the arthritic diathesis resulting from the depressed vitality and the defective catabolism of the condition, saturates the blood plasma with acids of the fatty series, with acid urates,¹ and with their derivatives, producing thus certain diseased conditions by the changes effected in the bodily tissues and fluids, secretory and excretory. The result is an entire series of abnormal constitutional conditions, both primary and secondary, associated with gout, rheumatism, diabetes,² and other expressions of the arthritic diathesis.

As part of the accompanying phenomena in the morbid conditions mentioned we at times observe secondary effects, none the less characteristic, in the dental apparatus and the mucous membrane of the mouth. Among these are rheumatic inflammation of the gums, alveolar neuralgia, acidity of the mouth, looseness of the teeth, nervous palatal constriction, alveolo-dental abscess, expulsive gingivitis, chemical abrasion of the teeth, dental tartar and deposits of sordes, and dental caries of constitutional origin.³

In my observation of cases of affections of the buccal mucous membrane and of the peculiarities of dental caries among patients with hyperacidity, in view of differences noted among them I have been led to study individual variations, both in primary and secondary stages, and to follow the chemical changes in the saliva, urine, and sweat.⁴ In such analyses of saliva and sweat, where the cases present chemical abrasion of the teeth, the percentage of acidity is less than among those who present clear cases of hyperacidity, as in gout and rheumatism, and the same is true on polariscopic examination for uric acid. On the other hand, oxalic acid appears in the urine as crystalline calcium oxalate, and the sulphocyanides of potassium and ammonium are found in the saliva in excess. In

¹ Organic alkaloïds, and the urates, basic, acid, and neutral, are the waste-products of tissue function. (Gautier.)

² Gautieret considers the appearance of sulphocyanides in excess as a warning of the approach of diabetes in the hyperacid diathesis.

³ I have found some of these conditions as primary also, without evidence of diabetes, but accompanied by excess of acidity. Urinary analysis, in doubtful cases, will determine the differential diagnosis.

⁴ Human saliva, like the urine, is subject to physiological oscillations in its reaction, in constant relation with the chemical processes of the Σ organiœm. (Vielland.)

such patients the constitutional effects do not appear upon the gums, but dental erosion is unmistakable.

For the moment I do not assert that the salivary glands secrete sulphocyanides in excess; these elements are constant in the saliva of patients who may show no trace of chemical abrasion of the teeth. But in the case of others such dental affection is pronounced. The surface of the teeth is dissolved by molecules, but into no apparent necrosis, and this condition is produced by the chemical principles excreted by the follicles scattered over the epithelial lining of the mouth, especially of the lips. The more concentrated such chemical substance the more evident is the erosion.

Chemical dental erosion is undoubtedly of constitutional origin, and among rheumatic patients is characterized by peculiarities which have excited the interest and the therapeutic efforts of numerous observers; such are the absence of bacterial caries, the situation of the erosion upon the labial aspect of the incisors, the special form of the eroded areas, and the slow but certain destruction of the teeth attacked.

At first these abrasions are seldom accompanied with pain, but at times the loss of tooth-substance is so extensive that the parts are very sensitive. There is then, without doubt, a compensatory effort on the part of the pulp to secrete a secondary dentine; I have found incisors in which the pulp-cavity has become occluded by this new-formed dentine. In certain cases the hyperæsthesia is so intense that the lightest touch occasions intolerable pain.

The surfaces eroded are generally smooth and polished, and as their edges are sharp and their contour is peculiar, they may be mistaken for the effects of chemical abrasion.

In the "American System of Dentistry," Dr. Black publishes an article on abrasion and erosion of the teeth which concludes as follows:

"Dental erosion is an affection characterized by loss of substance of the teeth without apparent cause, varying in its form, but which may go on to almost total destruction of the dental crown.

"Such loss of substance occurs on the labial surface of the front teeth, and while certain forms may be produced by chemical action, others appear to be due to mechanical influences.

"The cause of such dental erosion is one of the most obscure problems of dental pathology, and our present information does not enable us to explain it.

"It is, therefore, the duty of each writer to consider this question of causation, and to base his studies upon earnest observation and experiment, in such fashion that we may hope for the solution of the problem."

Dr. Etchepareborda, of Buenos Ayres, in a communication to the International Dental Congress of 1889 (on the Influence of Rheumatism in the Production of Diseases of the Mouth and especially of the Teeth), handles the question from the view-point of the secondary effects of a diathesis, and his article deserves our attention. I quote certain affections of the mouth and the teeth. He has collected ninety cases in which there occurred the following buccal and dental diseases: Alveolar absorption alone, twenty-five cases; alveolar absorption with gingivitis, forty cases; alveolar absorption with osteo-periostitis, fifteen cases; spontaneous loss of teeth, eight cases; caries with alveolo-dental periostitis, two cases.

Etchepareborda concludes as follows:

"1. The teeth, the jaws, and the soft parts of the mouth are frequently the seat of maladies of rheumatic origin.

"2. These may accompany, precede, or follow the rheumatic manifestations in joint, muscle, and fibrous tissue, acute, subacute, or chronic; or they may remain for a long time the only visible expression of the diathesis.

"3. The most frequent effects of rheumatism are,—(a) of the teeth: alveolar and alveolo-dental periostitis, dental necrosis, and spontaneous loss of teeth; (b) of the gums: simple or aphthous inflammation; (c) of the nerves: facial neuralgia; (d) of the jaws: alveolar absorption, caries, and necrosis of the maxillary bones.

"4. Though any one of these local affections may be considered as rheumatic, they are also observed, in the same chemical form, among patients who are not rheumatic; in other words, their origin may be either local or constitutional. It is impossible to determine their place in the chronological order of rheumatic manifestations, but in general they appear late. Their maximum frequency occurs in middle life, that is, between twenty-five and forty years of age.

"5. It is especially in the indefinite and chronic forms that we observe these rheumatic affections. They often alternate with each other. In chronic cases, for example, a subacute attack involving the fibrous structures of the joints, or the muscles, is often

followed by decrease in the affections in the mouth. These cases may be treated without fear of causing local trouble of the same kind or more serious; and, indeed, it is necessary to treat them on account of their steady progress. In considering the therapeutic indications, one must never forget the foundation of constitutional rheumatism upon which they rest, for they demand not only local attention, but general treatment as well."

My experience is corroborated by Dr. Rosenthal, of Nancy, in his paper on "Secondary Changes in the Dental Apparatus;" noting, as he does, the effect of constitutional conditions upon the teeth, and I am glad to acknowledge the value of his article; his cases are well chosen and characteristic of various pathological states of the teeth. Farther on in this monograph, and fortifying my position by the special chemical study of the saliva and the urine, I shall endeavor to probe still deeper into this matter; and I do not doubt that more complete knowledge of the saliva in diatheses would put us in possession of more radical methods for the cure of dental diseases.

The expression "chemical erosion" of the teeth, according to Bödecker ("Anatomy and Pathology of the Teeth"), "designates a process by which the hard tissues of the tooth are scraped and destroyed, chiefly on the labial surface near the neck of the tooth. It is marked by loss of substance in the tooth, occurring without apparent cause. It begins in a small spot on the surface of the tooth, a hollow or groove is formed which little by little increases till often a large area is destroyed, and this lesion is situated on the labial surface of the crown and most often on the front teeth.

"The authors who have studied erosion term it chemical abrasion and destructive denudation, which are synonymous. Such erosion consists in an excavation of the enamel of certain of the front teeth, usually situated midway between the neck and the biting edge of the tooth, but sometimes at other points on the crown.

"At first the incisors, then the bicuspid, are most frequently attacked, either of upper or lower jaw; and the erosion is not limited to one tooth, but progressively involves others, appearing in about the same place as on those first invaded. The disease advances with time, and the amount of destruction depends upon the epoch of the primary attack. The form of the abrasion does not vary on one tooth or the other, for the second and third are injured as was the first; at the same time, it is seldom found that the trou-

ble is of equal extent upon different teeth except in the case of the central incisors.

"The area destroyed presents many variations in its relation to other and normal portions of the tooth. Usually the form of the erosion is a vertical triangle, the apex towards the pulp and the base peripheral. But while towards the free border of the tooth there is an angle of varying sharpness, and an incline leads rapidly to the bottom of the erosion, towards the gum the area tapers gently upward and ends as a shallow groove near the neck of the tooth. The eroded surface is smooth and glistening, or, in some cases, rough and opaque, and this latter appearance is due to a beginning caries. The color of the part at first is white or yellowish white, from reflection from the dentine and cement; but at last it becomes dark yellow or even black.

"The pathological anatomy of the lesion requires no special description; under the microscope the same appearance is presented as in the case of mechanical abrasion. There is a formation of secondary dentine in the pulp-cavity which explains the great sensitiveness of such teeth."

This is the description of chemical erosion or abrasion which is given by the American author, which I desire to complete by calling attention to certain characteristics of this malady and especially its relation to the labial glands.

Certain specimens in my possession present the following points of interest:

These chemical abrasions vary infinitely in their outline and depth, but their situation depends always upon the position of the labial glandules, which, as we shall see, are the secreting organ—in some pathological conditions to be more precisely described below—of the active chemical agent which produces the erosion. One type of this affection, according to my observation, may be described as an intermittent contact of the glandular excretion with the surface of the tooth, by which the enamel is dissolved by degrees. The lesion does not extend far at first, but merely hollows the tooth, owing to the relation of the excretory orifices of the gland. At this time, according to my specimens, the eroded surface has terraced borders and smooth bottom, and the natural color is retained. In time the erosion increases superficially and in depth, and even undermines the enamel; for the active principle flows in various directions and thus produces the defect. Usually the edges

are sharply cut, but they may be dull and rounded. The appearance of caries is so unlike the above that it is not possible to confound the two conditions.

The number of the teeth involved may be small, limited to one or two, or all the front teeth are attacked. In a case reported (Fig. 2), the right canine is scooped out on its entire labial aspect to nearly the whole thickness of the tooth, and resembles in form the mouth of a flute.

The destructive process lasts a long time, for the active agent of the process is excreted only in infinitely small amounts, and the contact between tooth and gland is intermittent; and the feebleness of the chemical action is an additional cause.

(To be continued.)

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on Tuesday evening, January 2, 1900, at the office of Dr. Louis C. Leroy, No. 6 Lexington Avenue, New York, the President, Dr. E. A. Bogue, in the chair.

The minutes of the last meeting were read and approved.

The President.—As we have so much of importance on hand to-night, we will omit communications on theory and practice, and proceed at once with two papers, the subject of which is the use of nitrate of silver in dentistry. Dr. J. Morgan Howe, who was to have read one of the papers, is unable to be present, but has sent his paper, which the secretary will read.

(For Dr. Howe's paper, see page 237.)

DISCUSSION.

Dr. S. H. McNaughton.—While my experience with nitrate of silver has been quite limited, it has been on the whole very satisfactory. I believe that by its use alone I have in several cases made fillings unnecessary, and by its use in connection with fillings made

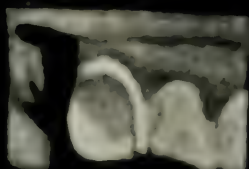


Fig. 2.

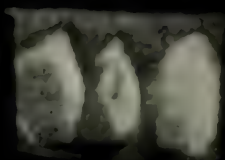
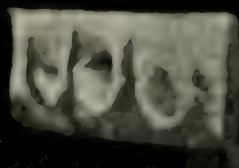


Fig. 1.

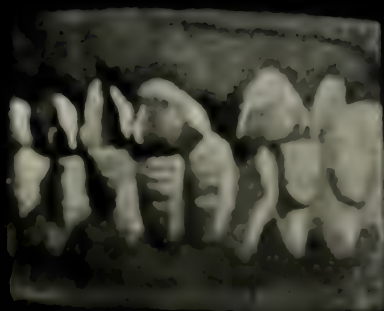


Fig. 3.

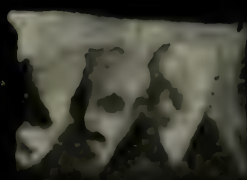


Fig. 4.

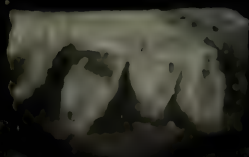


Fig. 5.

Types of chemical abrasion of the teeth.

more permanent operations and caused the dentine next to the plug to become less susceptible to attack by caries.

Of course the feature of its darkening the portion of the tooth to which it is applied, and sometimes much more than this, is an objection, and one which I fear may never be overcome, as when applied to superficial caries we expect no good results unless we have the characteristic stain; and if after a while we notice a loss of stain or a white spot appear as though the pigment were being dissolved away, we may be sure that the nitrate is not holding its own against the progress of decay.

For convenience in using I procure the salt in crystals, which I keep in a dark bottle; into this bottle with the nitrate a pledget of cotton saturated with water is placed, so that in a little time this becomes a saturated solution and is always ready for use. When I desire to use it I take a very small pledget of cotton or spunk on my pliers and dampen it with this saturated solution. I take away any surplus of the solution, as by so doing it is less apt to touch parts where it would do no good and might make an unnecessary stain.

Of course this stain is due to some black precipitate. I am not prepared to say just what this is. Bartley (1898) says, in speaking of silver nitrate, "On exposure to the light in the presence of organic matter its solutions turn black and precipitate metallic silver." Roscoe (1896) says this salt (silver nitrate) undergoes decomposition when exposed to the sunlight in contact with organic substances, and a black substance of unknown composition is formed. But whatever this substance be, it is exceedingly insoluble.

From its solutions metallic copper precipitates the silver as a fine powder; by mercury the silver is thrown down in arborescent form; gold and platinum cause no precipitation. If a pill of tin-foil be placed in a solution of the nitrate, it will become black and break into pieces, settling to the bottom as black powder and flakes.

In the application the action is not always the same. Sometimes there will be minutes before there is a perceptible change; at other times the precipitation will appear as quickly as though black varnish had been applied. Applied to dentine which has been previously stained by an amalgam filling, instantaneous staining takes place.

In one case where the teeth showed the greatest tendency to decay that I have ever seen,—application of it to a corono-buccal cavity,—it not only became black at the place where the nitrate was

applied, but the discoloration (not so much, of course) extended over nearly the whole side of the tooth. In another instance, where an anterior approximal cavity in a lower molar had been prepared for a gutta-percha filling, it was intended to touch with the nitrate the cervical border, including the so-called vulnerable point, but some of the solution got under the enamel at this point and caused a discoloration to the depth at least of one-sixteenth beyond the excavation into what appeared to be fairly sound dentine.

The following are the principal conditions in which I use this salt: For superficial decay at the cervices of teeth. Under some circumstances the first indication of something going wrong with the teeth will be a whitish line along the tooth or teeth closely parallel with the gum margin, in some of the very bad cases being most noticeable on the buccal and lingual surfaces of the molars, both upper and lower. It appears as though some solvent had been at work and had dissolved any deposit which had been on the teeth, or had refused to allow any to remain in this particular territory. At first the only perceptible result is to clear the tooth or teeth and make them appear whiter. In a short time there will be a long narrow white line of disintegrated enamel. The nitrate applied to this will produce the characteristic stain darkest in the line of disintegrated enamel and shading off towards the occluding surface.

In cases like the above the conditions are favorable for decay, but the following case, I think, will show very good results from the use of the silver salt. Mrs. C., who has always taken the greatest care of her teeth, and who, since becoming a patient of mine seven years ago, has had her teeth examined about every two or three months. One of her regular visits should have been made in September, 1896, but owing to sickness she did not come until November, and then was quite despondent regarding her teeth, as she said they were going very fast and that one was quite loose. Examination showed a bad condition of the teeth at the edge of the gums, in some places the white line of disintegrated enamel, with slight pits here and there, and extending nearly around some of the molars, while on other teeth there would only be the clean surface spoken of before. The left central was quite loose; perhaps "springy" would give a better idea of its condition, as it seemed as though the walls had become thinner and less firm. There was a pocket on one side, and I found that I could put an instrument nearly to the apex. This was a condition which had developed since her visit in July.

She told me that she had had a very peculiar sickness; that for over two weeks not a particle of saliva came into her mouth. Her appearance, she said, would indicate mumps, but her physicians said it was not mumps. I have since seen the description of a rare disease, xerostomia, which means dry mouth, and which was undoubtedly the same disease from which this patient had suffered. Following this sickness were the conditions just noticed. It was what might be termed a "desperate case." Applications of the nitrate were made to all places where the white or bad line appeared, and now, after three years and a half, fillings have been put into two or three of these places, while applications were made to nine or ten teeth. Although not in any way treated with the nitrate, I might say that the pocket alongside the central has been closed, and that it would be difficult to find any trace of it now.

Another place where I use the nitrate is in all cavities of temporary teeth other than those of the incisors; if the decay be only superficial, touching with nitrate may suffice, or if the tooth is to be filled, apply to the cavity before filling.

Two bicuspids somewhat more than superficially decayed were treated with this salt three years ago, and, so far as I can see, are in a condition not likely to require fillings at any future time. Young children will sometimes have the superior molars quite badly decayed on the buccal surface. These cavities will be broad and shallow in places, with margins of chalky enamel, and it is difficult to know when to stop with the excavating, if, indeed, the choice is left with the operator, for these teeth are usually very sensitive and the patients not the ones with the greatest pain-bearing qualities. After such excavating as is possible, these should be touched with the nitrate of silver and filled with amalgam, zinc phosphate, or a mixture of zinc phosphate and amalgam, and good results may be expected. If the cavities are sufficiently deep, perhaps gutta-percha will do very well. Dr. Elliott once mentioned to me that he nearly always touches with the nitrate, roots which are to be crowned. I have done this, and believe it to be good practice.

Dr. Bethel and others have advocated its use in the treatment of pulp-canals by depositing the silver in the canals by the use of the electric current. I have only tried this method once, and then on a very small root which had given much trouble and had been unsuccessfully sealed several times. A single treatment was successful, although I have no idea that I deposited the silver on the walls of

the canal to anything the extent that was done in the specimens exhibited before this society a couple of years ago, but I think I got a good antiseptic condition, and perhaps everything organic was embalmed.

Dr. Charles O. Kimball.—Gentlemen, I have a communication from our associate member, Dr. Hopkins, of Boston, which I should like to read:

“DEAR DR. KIMBALL,—I am sorry I cannot attend the January meeting of the Institute. I have used nitrate of silver in my laboratory experiments, and have found that it made the teeth much more resistant to artificial caries. Chloride of antimony will do the same without discoloring the teeth, but I doubt if it is safe to use it in the mouth. Possibly such care might be taken by an operator of great skill that no harm could come from its use. I am happy to tell you that I have just succeeded in producing artificial caries with a pure culture of the *bacillus mesentericus vulgatis*. The media was one per cent. glucose bouillon, and the time was nine months. There are many other forms, probably, that will do the same, and it will now be much easier to work them out.

“I believe this is the first *authentic* instance where decay has been produced by pure cultures of mouth bacteria, and I feel that it is an important step in advance. There is no secret about it. I should only be glad to find others working in the same line.

“Sincerely yours,

“S. A. HOPKINS.

“BACTERIOLOGICAL LABORATORY, HARVARD MEDICAL SCHOOL.”

Dr. R. H. M. Dawbarn.—I have been particularly interested in the subject under discussion. I have no doubt but that this property of arresting decay is due to the antiseptic value of the nitrate of silver. The silver salts have always been placed almost at the top of antiseptics. A few years ago Dr. Miquel, of Paris, went carefully over a long list of the most effective agents for preventing putrefaction in bouillon. Surgeon-General Sternburg, U. S. A., subsequently repeated and verified most of his assertions. You may perhaps be interested to know what the five most powerful antiseptics are, in their order,—

1. Biniodide (the red iodide) of mercury, which will prevent putrefaction in a beef-tea preparation, 1 to 40,000.

2. Iodide of silver, 1 to 33,000.

3. Freshly prepared peroxide of hydrogen, 1 to 20,000.
4. Bichloride of mercury, 1 to 14,300.
5. Nitrate of silver, 1 to 12,500.

That these are very much stronger than carbolic acid is seen by the fact that the latter will prevent putrefaction in beef tea only when the proportion has become as strong as 1 to 333. Of course, as to the objection to the use of nitrate of silver, it is a double one, as the writer of the first paper has pointed out: first, discoloration, and second, pain. As to the discoloration, when we use the nitrate we are in reality using indelible ink, and its internal use in the fields of medicine and surgery has for this reason been limited for many years. I do not know whether any one here to-night has ever seen a "blue man." I have seen one; and they need not be uncommon. The ghastly blue-black hue was given to the skin by the prolonged use of nitrate of silver internally, in this case to cure epilepsy, a method no longer employed. The color differs very markedly from the brownish black of the negro. Now, the suggestion which I would make here is that you follow in the footsteps of the other practitioners of surgery and substitute for the nitrate the more powerful iodide of silver, which stands next to the very head of all antiseptics, as just stated; or else that you try some one of the newer salts of silver which have been brought forward for this very reason, to prevent staining and also irritation. We have the citrate, the tartrate, or may use one of the albuminates of silver,—argemone, for instance. These possess a somewhat similar antiseptic value to the argentic nitrate, but have not its discoloring properties.

Dr. W. St. George Elliott.—There is one point regarding the use of nitrate of silver which seems to me of great importance. Theoretically it is perfectly sound, but practically it is not yet proved. I refer to the thorough sterilization of root-canals by the use of nitrate of silver in connection with the cataphoric current, by introducing a solution of the salt into the bulbous portion of the canal and then carrying it through the canal by means of the current, and afterwards removing the debris. We know that by the aid of cataphoresis nitrate of silver may be carried through the entire length of the canal and as much farther as we may choose to carry it. If the case is then dismissed and seen the next day, the contents may be removed without the likelihood of further trouble.

In regard to the lactate of silver, I have used it for one or two years, but so far as my experience goes I have found nothing like

the same results as with the nitrate, which latter I use in every cavity which is not exposed to view. There is an objection to the use of the nitrate of silver to be followed by an amalgam filling, as that filling will always have a black ring around it, and if seen by a dentist who is not familiar with the work, he may remove the filling, thinking it imperfect. Dr. Taft once said, "The stain of nitrate of silver is very superficial and easily removed." This, however, is not always the case. I am reminded of a case I saw in London a few years ago. The patient had a prominent canine, and the dentist, who, I am ashamed to say, was an American, instead of drawing it in, cut it down one-eighth of an inch with disks. The result was extreme sensitiveness, beyond the ability of the patient to stand. She returned to the dentist, who painted it with nitrate of silver. This had been done many years before, but the tooth was still much discolored.

Dr. L. C. Leroy.—In this connection I wish to call attention to the value of chloride of zinc as an obtundent, both in cases of abrasion and sensitive cavities. I have had excellent results, and it does not discolor tooth-structure.

The President.—I take great pleasure, gentlemen, in presenting Dr. Flanagan, of Springfield, Mass., who has kindly consented to read us the paper of the evening.

(For Dr. Flanagan's paper, see page 245.)

DISCUSSION.

Dr. Elliott.—This is an exceedingly broad question, and at the same time it does not seem to me at all a difficult one to understand. While I sympathize very fully with the speaker in his desire to awaken in the profession charitable instincts, at the same time there is a great deal to be said on the other side. That the poor are entitled to our best attention goes without saying. This fact has probably been better recognized in other countries. In England particularly a great deal has been done, far more, I fear, than will be done here in a generation. There it is quite the custom to appoint a dentist to all the public institutions. In some sections in England the school children are examined, prior to their entering upon their course of study, by a competent man who gives them a chart and insists upon their going to a dentist and having their teeth properly cared for before they are allowed to enter the school.

I have, as I suppose is the case with all the gentlemen present,

received a large number of gratuitous patients, but something ought to be done in a more general way. I am sorry to say that I had very little success in this direction. In speaking to some of the staff of St. Mary's Hospital, I asked, "Is it not true that in most of your children the dental organs are in bad condition? Is it not of the utmost importance that the child should have proper dental organs for the mastication of food?" Of course, these gentlemen admitted this, but it took six months before sufficient funds could be raised to procure a suitable outfit for the hospital. I took up the work and for two years carried it on, spending an afternoon every week there. Ninety-five per cent. of the children had very bad teeth; in many cases not a single sound tooth. Many were suffering, and there were many cases of abscess. They were, indeed, in a pitiable condition. I appealed to those in charge of the hospital. I tried to meet the directress, but failed. I thought I had done all I could. My impression was that they should take a dental student and put him in charge of the children's teeth, paying him a reasonable amount, which need not be large. Nothing, however, was done. The instruments are still there. No successor has taken my place. Six or eight months have passed, and there the matter remains.

I have spoken to many physicians on the subject, and they all seem to recognize the necessity. The average physician does not know anything about dentistry. At one time I was surgeon in charge of the Ninth Army Corps Hospital. We had six surgeons, and not a single one who could treat an ordinary case of dental abscess. I myself must plead guilty to the same thing. I always relegated those cases to the hospital steward, and the only dentistry he did was extraction. It is true that there are men appointed to some of our institutions. I know of the dentist who has charge of the children in the Juvenile Asylum. I am told that all the dentistry done there, as in most of our public institutions, is extracting. Now, it does not require a great amount of talent nor a great amount of skill to treat children in our public institutions and do all that is necessary to be done, and this work could easily be done by students. It is very plain to be seen why our public institutions are not supplied with the best dental as well as medical skill. The medical practitioner requires a much shorter time to treat his patients than does the dentist, and for this reason he need never spend more than half a day in his office, thus leaving at least a balance of time for hospital work. The dentist, whose operations are long-

must spend his entire time at his office. It is not that we are less charitable, but it is out of the question for us to close our offices often to attend a clinic. Something else must be done, and the only solution I can find is the employment of students.

Dr. Leonard Weber.—In looking over the abstract of Dr. Flanagan's paper, to which we have just listened with interest and pleasure, I noticed at once the importance of certain questions raised by him, and did not hesitate to accept your invitation to take part in the discussion.

To understand and practise the healing art of diseases of the teeth, gums, and alveolar processes alone, as a specialty resting on the basis of anatomy and pathology, means a good deal more than simply filling and pulling teeth. This has long been recognized by your leading men and colleges, and the requirements of the modern students of dentistry in the knowledge of anatomy, physiology, and pathology have grown in proportion to the demands of broader culture for the practice of this profession.

The instant we go beyond these narrow lines of dentistry, as understood up to the present time, we enter upon the broad field of general medicine and surgery, and it seems to me beyond question that an accomplished stomatologist will be forced to have as much education in general medicine as, for instance, a practitioner of otology is expected to have; that he must be, in fact, a medical man, who practises stomatology as his specialty.

Now, as to the first question, Are the practitioners of dentistry in the habit of doing any charitable work? Certainly, but rather individually, sporadically, and in connection with their own schools have they done so thus far. The immense field of public charitable work, however, they have scarcely entered. Why not? Because they have not been asked to come in. And why have they not been asked? Because they have not come as an organization before the various boards of trustees or directors of dispensaries and hospitals and offered to do the work that belongs to them, and said that they were ready to do their share and insisted upon getting it.

Go the rounds of dispensaries and hospitals, and you will readily find out that the sick poor—who are not in the habit of going to the dentists for obvious reasons—suffer not only from carious teeth that need filling, or stumps that need to be removed, but from various consecutive disorders, such as ulcerative gingivitis, fistulas, abscesses, facial neuralgias, phlegmonous inflammations, dyspeptic

conditions, and, as we now know, from various autoinfections caused by the action of putrid material and pathogenic germs which may and do enter the general system from diseased foci of the mouth, just as from the gastro-intestinal tract.

Now, good dentistry applied in time to these cases is the best preventive medicine, better than rhubarb and soda to soothe the stomach or chinin to treat a neuralgia of this kind. And to cure such patients without the dentist's help would be asking to remove an effect without trying to remove its cause.

Out of many instances to the point which I could cite, let me give you only one, and a rather serious one, too. About three years ago a servant girl, twenty-four years old, apparently robust and without hereditary taint, came to me, saying that she feared she was going to be ill again as she had been two years before, when she lost a good deal of blood from the mouth and had to stay in hospital for about three months. On examination a case of hemorrhagic purpura—*i.e.*, Welhof's disease—was disclosed: bluish-red purpura and petechiæ over a great part of the body, blood coozing constantly from gums and mouth, scarcely a sound tooth in it, the gums in an advanced state of ulceration. Her teeth and gums had been sore for years. No one had advised her to go to a dentist, and if they had, she had not the money to pay for extensive treatment. Knowing from other experiences that purpura often is of infectious origin, I believed that the infection in this case came from chronic ulceration and inflammation of the gums. I had the patient in hospital about two weeks, just long enough to use the requisite local antiseptic and general supporting treatment, and then put her in the hands of a good dentist. She recovered entirely, was soon well and strong again, and has remained so ever since. When I related this case before a medical society I was not at all surprised to learn of similar experiences on the part of some of the members present.

Going back many years, when I did my share of dispensary work down at the Northern Dispensary,—from 1868 to 1870,—our apothecary there had assumed the task of pulling teeth. He was not very bad at it, but was awfully glad when I offered to relieve him of this particular duty. I know at the present moment of but one of your profession who holds a regular appointment as dentist to a large and well-known dispensary in this city, but he is paid for his services by the month. He is not a doctor of medicine, and does

not belong to the Medical Board of the dispensary. When you gentlemen get together and establish some central plant of your own to do your public charitable work, which, I presume, you will try to do with the financial help of some of our ever-generous fellow-citizens, and more or less money which you have to put in yourselves, you may call the institute what you will think best, and go into the treatment of surgical diseases of the mouth as far as may be right. When you come to ask for appointments in dispensaries and hospitals, I believe you have to come in as practitioners of dentistry, unless you are graduates in medicine. We physicians are not hard to get along with. Though some of us, perhaps, are playing too much "dog in the manger" at times, the majority are liberal, but they are a bit jealous and suspicious in having titles created for new and comprehensive departments in this latter-day specialization of medicine. Provided you have a previous understanding with the medical boards of the various charities before you apply to the boards of managers, no serious opposition will be encountered by you in your laudable and timely enterprise. The public will be with you, of course. They love you fully as much as they do us; though they may not always like your bills, they are proud of your work. Many of them show it, too, and will naturally be delighted to get something good and useful for nothing. From all view-points it is a good thing you want to do; it is timely, also, and what is good and timely will succeed.

Dr. D. B. St. John Roosa.—I may as well say, in the beginning, that, except for a brief conversation with the President and with the speaker who has just preceded me, I have not prepared myself for the discussion this evening. I believed that I should find ample material for my part of it in what might be said before my own turn came, and I am not disappointed. In the first place, I am very much impressed with the fact that when professional men begin to investigate, or hear the results of such an investigation, into any other profession than our own, we very soon find that the world is just as bad in that direction as it is with us. In other words, we find that neither their ideal nor ours has been reached. And we find that we are living in a world where it is constantly necessary to keep the weeds out, so that the flowers and the useful things may grow. The dentists have reached the point when, perhaps, they think that the weeds are choking the flowers pretty badly. This may be so, but when I think how much each one of us here to-night,

outside of your profession, is indebted to your successful labors for his capacity to eat and digest his food; when I think of the high position of dentistry, especially in this country, I wonder very much that you remain, for some cause or another, with a great wall between yourselves and ourselves, who are members of the medical profession, although in many instances also specialists.

As regards the necessity of your presence in public medical institutions: Suppose any dentist came down to the Post-Graduate Hospital, or the Manhattan Eye and Ear Hospital, with both of which I have relations, and said, "Why, many of these patients, the young people especially, are suffering from their eyes or their ears or their stomachs because their teeth are in an absolutely fatal condition to perfect health." Now, we will all admit this, but what are we to do? We cannot hire dentists to come down and take charge of these cases, and they will not come without being hired. One gentleman here has practically told us that it is impossible for one of your profession to make a living without working from ten to twelve hours a day. I do not believe it is necessary or wise to spend so much time in your offices. I know that I would not be living to-day if I had devoted ten instead of five or six hours a day to practising my profession in an office. Your fees may not be large enough. The sooner you make the people believe that the teeth are just as important as the ears or the eyes, the better it will be for you and for mankind. In my judgment you have not, with your fees, reached any conception of your capacity and skill. You work too much as mechanics, too little as surgeons.

You know how dentistry began in this country. There were certain practitioners of medicine who began to study the surgery of the teeth, and in due course of time they began to practise dental surgery exclusively. I think it was in Baltimore that the first organization of American dentists sprung up, and at the beginning dental surgeons were medical men. Why did dentists ever depart from this position? It is not such a very difficult thing to get a medical degree; and I think the fundamental trouble is right here, that dentists do not insist on their successors getting the degree of Doctor of Medicine. Of course, all this general knowledge is not important in one sense in your profession, but in a certain sense it is of the greatest importance. It gives men a general conception of the human body, which prevents them from getting rattled when anything happens beyond the teeth. There is no reason why den-

tists should be outside of the medical profession any more than ophthalmologists or otologists. We need you in the medical profession, in our hospitals and colleges. The separation is absolutely unnecessary and illogical, and it cannot continue. At the Post-Graduate Hospital we have a dentist who, I believe, is also a graduate of medicine. He is attached to Dr. Powell's clinic, and he is of the greatest service. He does not practise general medicine, but he does first-class work.

When I had the honor to be a member of the Council of the New York University I became interested in seeing a dental department established, each graduate from that department to have the degree of M.D. Although I had the full sympathy of the board, there was a general indifference on the part of dentists and bankers, and between the two the scheme came to nothing. But I am as sure as I am of anything which I can simply foresee, that it is only a matter of time, and perhaps a very short time at that, when we shall all be together again. I say "again," because we began together.

Mr. President and gentlemen, it is a very great pleasure for me to be here to-night. I remember attending two or three years ago, when you were kind enough to invite me, and I was impressed with the scientific merit of your discussions and papers. You should deal with this problem also in all seriousness. You must, in order to be professional, do a certain amount of charity work, and public charity work. Far be it from me to insinuate that you do not do charity work in your private practice, but the sooner you engage in public charity work the better. The sooner it is understood that in our infirmaries good advice may be had for bad teeth as well as for bad legs or bad lungs, the better it will be for the health of this great community. I have no doubt there are men who will give you money when they see how serious you are about it, and also that the government of the United States will take care of the teeth of its army and navy if properly approached. At any rate, we are not so badly off in this country, in this respect, as in one other country. Have you read in the *British Medical Journal* of the recruits who were rejected on account of their bad teeth, and finally had to be accepted, bad teeth or not? Have you looked seriously to see the whole of England growing up with bad teeth? Even noblemen have bad teeth in England. Fine ladies have bad teeth in England. Our American woman thinks it a reflection upon herself to have bad teeth. So let me advise you to go ahead with your charity work.

Establish in this city proper places where such work can be carried on, and the rich men of New York will be glad to pay for it.

J. Cleveland Cady.—I fancy that the professional men before whom I have the honor to speak this evening have reached their high standing by means similar to those which an accomplished skater availed himself of to attain his proficiency. Said the young lady who had been looking on with rapt admiration, "Why! why! as you have been skating so gracefully you have cut your monogram on the ice! How could you do it? How did you acquire such an accomplishment?" "Oh," he replied, with a sigh, "it took a great many sittings."

Through "many sittings" we gain valuable experience as we pass on in life. How often we wish for the opportunity to live life over again, that we might profit by our acquired knowledge! But though we cannot retrace our steps, we can turn the light of our experience on the paths of our younger brethren, so that after all our many sittings shall not be lost.

The alluring object before most young practitioners, whether of dentistry, medicine, or other callings, as they set forth in life, is to get a little clientele, productive of a moderate income, which shall give many comforts and pleasures, perhaps even luxuries. Later this ambition expands and includes means for support of a wife and a modest home; still later an advance that shall give influence, and with this there presently springs up the desire to become rich; and if he is a bright, pushing man, bent upon wealth, he probably will attain it, and in all likelihood live and die a commonplace man, in no respect an admirable character, or one whose departure from the stage of life is greatly mourned.

The life of the average practitioner is not an inspiring one unless something has entered into that life,—outside of itself,—its personal aims and ambitions. Recall in your own profession those whose careful and conscientious judgment you most respect, the sincerity and weight of whose character you most admire, and you will invariably find that they are the characteristics of one whose life is not self-centred, but whose heart and efforts have gone greatly outside his personal interests.

In some cases, where their own professions have offered no particular openings for beneficent work, they have found that which their souls longed for in the work of some of the various organizations and boards for relieving the unfortunates. They have inter-

ested themselves in the children of the poor as they met them in the mission schools; they have served efficiently on hospital boards, or in the work of prison reform, or perhaps in the cause of municipal betterment, and personally have found what their hearts craved, the uplift their souls needed, but their own profession has not been honored to such an extent as it would have been had their benevolent work been more directly connected with it.

Dr. Watson's touching portrayal of the two doctors, MacClure and Sir George, in "The Doctor of the Old School," that touching tale in "The Bonnie Briar Bush," decidedly elevated the profession of medicine in the minds of all who read it, and inspired many a young man with a noble ambition. People of wide observation know that there are many Dr. MacClures in our own country. Let me speak a moment of one who not long since went to receive the eternal reward of "a good and faithful servant." I refer to Dr. Love, of Montclair.

I had often heard of him in connection with the admirable little public hospital he founded in that place, with no small effort and sacrifice. Those connected with it often told me that the whole town loved and honored him, and that from his life the word "physician" had gained a significance in that place that it had not elsewhere. One day as I was lunching with a well-known public man, whose home was in Montclair, I happened to speak of the good doctor, and he responded, with no little feeling, "It seems to me everybody in the place is a debtor to him, and none more than I. After the birth of my last child my wife did not rally well; for months she was greatly prostrated and depressed. It seemed to me that he kept her life from going completely out. With his great heart he encouraged her and cheered her. He really bore her up till at length the change for the better began, and her health was regained. We owe everything to him."

Dr. Love's death was a most singular and beautiful termination to a life whose passion was for rendering service to those needing it. He was now an old and venerable man, yet attending his duties as fully and closely as ever. One day he had performed a most difficult and trying operation for a poor woman, a charity patient. It was the turning-point of life or death, and his skilful operation was a saving one; but as life was secured for her the wearied old physician sank back, his eyes closed, and his blessed ministries ended forever. The town was in tears and mourned for him as a father.

Some months later Ian MacLaren read to a large audience in the place his story of "A Physician of the Old School," of the noble and heroic work of Dr. MacClure. As he proceeded with the story a solemn and almost painful hush came over the audience, and its eyes were filled with tears. Said the narrator, "It was not Dr. MacClure whose image stood before them, but Dr. Love!"

I am sure you will agree with me that the spirit of such a life is something we all have reason to covet and earnestly seek, and that it is positively essential to any true life, to any worthy exercise of our powers, and if we cannot find opportunity for it in the lives of our own profession, let us by all means go outside, and find and exercise it somewhere and somehow.

But if one has an honorable pride in his calling, and longs to see that calling more and more esteemed, he will seek to make his profession a benevolent one, a generous one; one which without reward seeks to bring mercies and blessings to those in want; one which is quick to respond with a large and warm heart to the cry of human need; that knows by experience the spirit of Him who taught by His own example as well as by precept that it is more blessed to give than to receive. This spirit and rule exalts and glorifies any calling; without it the noblest profession becomes a mere mercantile pursuit.

Dr. Kimball.—There is but little that I can add. As I have listened to the remarks of our friends, Drs. Weber and Roesa, I have felt that they were striking at the root of the matter, the need of a higher education for dentists and a closer relationship of dentistry with its fellow, general medicine,—really the need of the day as far as our profession goes. I need not tell you, Mr. President, nor you, my fellow-members of this Institute, how close this has been to my own thoughts and to the thoughts of all those who have been associated in this Institute. Perhaps it may not be unfitting here to say that we, as an Institute, are even now taking steps to see if we cannot begin a definite charitable work, in connection with our organization, for the benefit of the city; a work which it is proposed to put upon the sound footing that is the basis of all wise hospital work as I understand it,—*viz.*, that the profession benefits the patient, and that the patient benefits the profession in return for the services received, thus bringing about a better knowledge and a higher degree of skill on the part of the practitioner. This, I believe, is the basis upon which all hospitals are conducted. The

work is not merely a work of healing, but a work of education. They go hand in hand. It seems to me that it is a necessary relationship, so that any infirmary or dispensary work which does not carry with it this idea of the betterment of the profession at large is radically faulty, looked at from the view-point of the benefits to humanity at large. There are details connected with this plan to which I need not allude. Dr. Elliott has mentioned the fact that it is difficult for the practising dentist to give the same amount of time to this work that the physician can. As we know, the physician can treat a case in a very few moments and with great skill, whereas the dentist has not only to give advice, but to go through a long mechanical operation which takes a great deal of time, even for the simplest things. Nevertheless, facing this problem and its difficulties, I may say that when our plans are fully carried out we expect to be able to undertake some such charitable work here in this city. I trust the time may not be far distant.

Dr. Leroy.—I would be only too pleased to contribute my services to a work of this kind. I endeavored to do this at the Northwestern Dispensary, but I find that for one man so much time is required that it is almost impracticable. I would suggest that we band ourselves together and contribute an hour at certain intervals.

Dr. Elliott.—I do not wish to be misunderstood in this matter when I spoke of the difficulty of giving time to this work. I am sure that with all my heart I would like to see some practical way develop in which this can be done. I will be very willing to give half a day a week to such a purpose, and I think if we all enter into the work there will be no difficulty. But we must not enter into it without due consideration. Many of us remember the dispensary which was started in Brooklyn, and which gradually dwindled away. I sincerely hope that this thing will be undertaken, but it must be done in such a way as to make a permanent success of it.

Dr. J. G. Palmer.—Dr. Leroy has brought to my mind the fact that a good many years ago, when I was a student with Dr. Streeter, I was connected with the Northeastern Dispensary, but the trouble was that they only wanted teeth extracted and nothing else done, so my work did not continue long.

Dr. Weber's remarks also brought to my mind the fact that one of our prominent associate members has been asked to accept a position as dental surgeon to the Hospital of St. Mary's, at Passaic, N. J., to be made a member of the regular staff without receiving

any salary, which position he accepted and is fulfilling the duties thereof. Regarding representation in the army and navy, it has seemed to me that if all of us would bring a little more pressure to bear, we might secure this representation. Dr. Roosa mentioned the fact that we should raise our fees. In this connection I call to mind the case of a physician in a New Jersey town who insisted upon his daughter going to Philadelphia to have her dental work done, because there were so many dental colleges there, and she could get it done for nothing.

Dr. Charles A. Meeker.—I believe the explanation of the whole secret comes from the medical side to-night,—from Dr. Weber. I think we should go as an organization to the trustees of these institutions. I trust this discussion will start the thing going in the right direction.

The President.—Possibly Dr. Weber does not remember the exact condition of things in Baltimore which about fifty years ago led to the separation of dentistry in this country from the general instruction of medicine. We were at that time informed by our medical friends that dentistry had nothing whatever to do with medicine, and, thus having been thrown off, we were obliged to shift for ourselves. This necessarily resulted in the establishment of a dental school, and from this beginning have grown all the institutions of that kind which dot our land. The essayist of the evening, alluding in the course of his remarks to interdental splints, has recalled to my mind quite forcibly one or two little incidents. An old lady fell down stairs and broke her jaw. The surgeon who undertook to set it had never had a case like this with no teeth in either jaw. He did not know what to do, and it never occurred to him that he might call a dentist and consult with him regarding an appliance. Instead he made a plaster-of-Paris splint, by applying which he thought it necessary to remove her artificial teeth. There was a ligamentous union only, and the good old lady died soon afterwards. The unfortunate surgeon did not think to put her artificial teeth back where they came from after knocking off a few of the front teeth, and then bandaging the jaws together. Another surgeon of national eminence, who has gone to his reward, had a case of something in the antrum, which he prepared to open externally. A dentist was called in to see the operation, and just before beginning, when the patient was anesthetized, the dentist took an exploring instrument and, passing it up through the socket of the

tooth, engaged a bit of root which had been forced through into the antrum, and showed it to the surgeon, who immediately removed it without the aid of the knife. An eminent surgeon was called to my house to see a lady who, from an impacted wisdom-tooth, already had half a dozen openings on her face. The surgeon lanced the abscess transversely to the striæ of the upper part of the temporal muscle, and as the lancet went across instead of parallel to the muscular fibres, there was a scar. I mention these cases simply to show the urgent need that there is of some harmony of work between all branches of the medical profession. I do not recognize dentistry as a profession; it is a specialty. I do not speak of what is called mechanical dentistry. It is only about two years ago, I think, when I had the pleasure of presenting at the Surgical Section of the New York Academy of Medicine an appliance invented and made by our fellow-member, Dr. Michaels, a dentist of Paris, for replacing the upper third of the humerus, including at the same time the whole of the shoulder-joint, the upper end of the apparatus being screwed to the scapula. This apparatus was inserted and worn for a year and a half. Little by little new bone was formed, and the apparatus was finally extracted, and the man to-day has a good arm. The same dentist made an artificial lower maxilla, which was inserted and worn until the death of the patient, which occurred a good while afterwards.

Dr. Roosa spoke of the bad teeth in England. It is true that lords and ladies have bad teeth there, almost as many bad ones as they have here, but at the same time the science of dentistry has made such progress abroad that we will do well to look to our laurels.

Dr. Flanagan.—I cannot tell you how pleased I have been with the discussion of my paper, and in reply I trust I will be excused if I get a little personal. Charitable work in connection with hospital and dispensary has been mentioned several times this evening. Now, all professional men may be divided into two classes, those who are looking to the pecuniary end, and those to whom the pecuniary part is a secondary matter. Why, gentlemen, it is not necessary to have a dispensary in order to do charitable work. It is not necessary to go into a hospital. It is not necessary to have the degree of M.D. You have in this city institution after institution where your services are needed. Suppose you give but one hour a week, that is fifty-two hours in the year. But what is needed is

organization in this work. I have the utmost confidence in this Institute of Stomatology,—and what more ennobling work than to be the pioneers in organized charitable dental work?

In closing I want to thank this society for its courtesy in asking me to come here to-night. This is a matter which is of great interest to me, and I have been awaiting an opportunity to present these thoughts to a society such as yours. I am at present engaged in this work in my own city. I am in New York now to buy a dental engine to be used in an institution where we have been doing this work, using a dollar-and-a-half easy-chair and carrying our engines back and forth. I trust that I have done some good, and that this work may be taken up by your society.

Dr. S. E. Davenport.—I think the Institute has been greatly honored this evening. We owe our thanks to Dr. Flanagan for his very interesting paper; also to a number of very busy gentlemen who have shown their interest in this subject by accepting our invitation to be present and discuss it. I move that a vote of thanks be extended to all of these gentlemen.

Motion seconded and carried.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

AMERICAN ACADEMY OF DENTAL SCIENCE. ANNUAL MEETING.

THE annual meeting and banquet of the American Academy of Dental Science was held at Young's Hotel, Boston, on Wednesday evening, November 15. About fifty members were in attendance.

There were present as guests of the evening, Harold Williams, M.D., Dean of the Medical and Dental Departments of Tufts College; Rev. Marcus D. Buell, D.D., Dean of the Theological School of Boston University; Rev. E. H. Byington, D.D., of Newton, Mass.; and Mr. John J. Euneking, of Boston.

Prior to the banquet, the regular business of the organization was transacted, and the following officers were elected for the ensuing year:

President, Dr. V. C. Pond; Vice-President, Dr. George E. Eames; Recording Secretary, Dr. Frank Perrin; Treasurer, Dr.

William Y. Allen; Corresponding Secretary, Dr. George H. Payne; Librarian, Dr. H. G. Hichborn; Editor, Dr. Charles H. Taft.

Executive Committee.—Drs. Frederick Bradley, F. G. Eddy, Thomas Fillebrown.

The post-prandial exercises were opened with a paper by Harold Williams, M.D., entitled "Education in Dental Medicine."

(For Dr. Williams's paper, see page 239.)

The Rev. Dr. Byington gave expression to the pleasure it gave him to be present, to the debt which he owed to the dental profession, and to the general thoroughness and fidelity with which dentists deal with their patients. The speaker pointed out some of the analogies between the work of dentists and that of preachers. He was of the opinion that the dentist should be an idealist, and that the most important and successful practical work in the world, of whatever nature, or connected with whatever profession, is done by those who are really idealists.

Among the thoughts that the Rev. Dr. Buell gave utterance to was this: That the most characteristic thing of every profession is *emergency*; that is to say, a situation suddenly confronting one, calling for the best thing that one can do, and giving no opportunity for special preparation. Emergencies make life fascinating, and the preparing of one's self to meet them is a work not only of to-day but of to-morrow,—a work that calls upon all our resources. The speaker was reminded of what happened when the French declared war against Germany: Von Moltke was sound asleep, when the door opened and he was informed that the French had declared war. He raised himself up on his arm and said, "Pull out the third drawer to the left there!" The drawer contained a complete plan of what was to be done in case war was declared. Von Moltke had studied war with France for something like forty years. He slept soundly the rest of the night, so the story goes.

"May I say, as a preacher may," said Dr. Buell, in conclusion, "God bless you in your great work. I must say, if I speak the truth, that your profession more and more is rising to the position where men of scientific training can inspect your work."

The next speaker, Mr. Enneking, outlined some of the essential conditions which must contribute to the making of good dentists and good artists. In either case, one must make sacrifices, and must so love his profession as to be willing to give up almost anything for it.

With the induction into office of the newly elected president, Dr. V. C. Pond, the meeting was brought to a close.

CHARLES H. TAFT, D.M.D.,

Editor American Academy of Dental Science.

Editorial.

THE DECISION OF JUDGE TOWNSEND.

THERE will be found upon another page of this number the decision of Judge Townsend in the case of the International Tooth-Crown Company *vs.* James Orr Kyle. As far as our reading goes this has not been given in full in any of the journals. There may be good reasons for this not appearing upon the surface, but as far as this journal is concerned a copy could not be procured until the present time.

In this connection and intimately associated with it, the reply of the Newark, N. J., dentists, who accepted the Crown Company's conditions, is also given. It is an answer to the criticisms of the *Dental Digest* by one of those interested, but it is presumed that it outlines the sentiments of all. It is given publicly in justice to the parties interested, the editor reserving the right to agree or disagree with the course which the writer has seen fit to adopt.

The decision of the judge includes some statements that seem to require explanation from the chairman of the Dental Protective Association.

In quoting from Judge Wheeler in regard to the testimony of Dr. Beardslee, Judge Townsend says, "In the present suit not one of these witnesses is able positively to identify said exhibit, and the 'wife of a clergyman and her two daughters' now testify, after an examination of church records, etc., that they were mistaken in their former testimony, and that the cap was not put into Mrs. Martz's mouth until 1878, or until after the Law invention was completed, as found in the Richmond case and further proved herein. Even Dr. Beardslee now says that he cannot now testify that said work was done any earlier than the year 1878, and that, so far as he knows, the testimony of the Martzes as to the date when

it was done is correct. And further, as if to cap the climax of these contradictions, an apparently disinterested witness, Dr. Palmer, testified that he himself made the Beardslee-Martz exhibit, and was told at the time that, 'whatever of the kind I did was for use in defending the suit of the International Crown Company.' It is unnecessary to further discuss this branch of the case."

Now, what can be the meaning of this? Are we to infer that these witnesses are the ones upon whom the Dental Protective Association relied in previous suits with the Crown Company, and that for some cause, not understood, have suddenly become afflicted with defective memories? No doubt the chairman of the Dental Protective Association can explain this; at all events, many would be pleased to know whether previous decisions were based upon this apparently unreliable testimony. It is thought that, in justice to the subscribers to the protective fund, a certain degree of frankness in dealing with this subject is their due. It is well understood, however, that the position of the executive officer of the Protective Association is a delicate one, and necessarily requires a wise withholding of matters that might prove of too great interest to the Crown Company.

The members of the Protective Association have had entire confidence in the chairman of that organization, and this has not been changed by Judge Townsend's decision. They have not been willing to accept the damaging charges freely circulated by the enemies of the association as worthy of credence.

The fact that the Crown Company does not seem to be making much progress in their crusade leads to the supposition that they prefer not to take the risk of another suit.

The concluding portion of the judge's decision will, perhaps, throw some light upon this; at all events, it may lead the Crown Company to hesitate before making a second contest in which relationship does not exist.

The judge stated that, "At the conclusion of the first day's argument, counsel for the complainant for the first time learned that the defendant herein was related to one of the officers of the complainant's corporation, and that one of its stockholders had contributed to the defence herein without the knowledge of counsel for defendant. Counsel for complainant at once fully and frankly brought this matter to the attention of the court and asked to be advised thereon."

SPECIAL NOTICE.

Word has been received at this office that some one in Illinois has been representing himself as an agent to collect subscriptions for the INTERNATIONAL DENTAL JOURNAL. Subscribers are notified that no one is authorized to take subscriptions in that State.

Bibliography.

GOULD'S POCKET PRONOUNCING DICTIONARY. Fourth Revised Edition. By George M. Gould, A.M., M.D. P. Blakiston's Son & Co., Philadelphia, 1900.

Dr. Gould's achievements in dictionary making are excellent. That one hundred thousand copies had been sold at the time of the appearance of the last edition is abundant evidence of the appreciation of his work. The new edition is invaluable to students of medicine, dentistry, and pharmacy.

It is enlarged by the addition of nine thousand words and their definitions, largely made up of eponymic clinical terms. The Dose Table has also been enlarged by the inclusion of the names and doses of drugs recently introduced, and the whole work has been carefully edited. Much credit is also due the publishers and printers for their part in the production of this work.

G. W. W.

Domestic Correspondence.

REPLY TO THE "DENTAL DIGEST"

TO THE EDITOR:

SIR.—There appeared in the *December Digest* an article entitled "Are there Traitors in the Camp?" the writer of which, after referring by name to certain Newark dentists who had made an honorable settlement with the Crown Company, says as follows:

“ Personally, we believe this so-called settlement is merely an arrangement between these men and the ‘ Crown Company,’ the ulterior purpose of which is to make it appear that some members at least have no confidence in the Protective Association, as this would, of course, tend to weaken the influence of our organization,” etc.

During the Dental Convention at Niagara Falls, when the newspapers published the decree of the court in favor of the Tooth Crown Company, Dr. Crouse declared that he was utterly surprised and dumbfounded, as he even did not know the suit was pending. All who were present at the Convention remember his talk, and that he sent for his lawyer, who also expressed surprise and professed ignorance of the whole matter. At that moment the idea occurred to me that if the men to whom we paid money to protect our interests could not keep track of what was going on in open court in a suit the outcome of which would be of more vital importance to the dental profession than any ever before instituted, then I need no longer look to Dr. Crouse or his lawyer for protection. That view of the matter would, naturally, destroy confidence. But equally bad, or perhaps worse, is the only alternative view,—that these two men, Dr. Crouse and his lawyer, were cognizant of the suit. And now, as if to further test our credulity, they cry “ Traitor ” when a dentist complies with a ruling of the United States Court.

I am a member of the Dental Protective Association, and gave my money that I might be protected against fraud and imposture, but not for witnesses like those described in Judge Townsend’s opinion :

“ To further support the defence of anticipation, *the defendant has introduced the same witnesses who, and the same exhibits which, were before the court in the Bennett case. The inexplicable contrast between the statements of the same persons in the two cases is either an object-lesson as to the fallibility of human memory and the uncertainty of human testimony, or is forcibly suggestive of perjury and fraud. . . .*

“ *In the present suit not one of these witnesses is able positively to identify said exhibit, and the ‘ wife of a clergyman and her two daughters’ now testify, after an examination of church records, etc., that they were mistaken in their former testimony, and that the cap was not put in Mrs. Martz’s mouth until 1878, or until after the Low invention was completed, as found in the Richmond case and further proved herein. Even Dr. Beardslee now says that he*

cannot now testify that said work was done any earlier than the year 1878, and that, so far as he knows, the testimony of the Martzes as to the date when it was done is correct. *And further, as if to cap the climax of these contradictions, an apparently disinterested witness, Dr. Palmer, testified that he himself made the Beardslee-Martz exhibit, and was told at the time that 'whatever of the kind I did was for use in defending the suit of the International Crown Company.'* It is unnecessary to further discuss this branch of the case.

" . . . *The defence of anticipation herein is overwhelmingly disproved by disinterested witnesses. The methods by which the Beardslee-Martz evidence of anticipation was secured by Dr. Beardslee in the Richmond case appears to have been questionable and reckless, and it is to be hoped that such practices are unusual. The contradictions in his testimony are so direct and material as to disentitle him to any consideration. . . .*

"Day's testimony has not been discussed because his veracity is attacked; his testimony is contradicted, and the facts stated by him, if true, would be insufficient for various reasons."

A few years ago this class of work was unknown to me, but there are others who claimed it was old. So we banded together to raise a fund that might be used to investigate and find out the former state of the art, and Dr. Crouse was intrusted with the task and the funds. What he has done is here stated by Judge Townsend in the United States Court. How he has spent the funds we do not know, but we think if he has proper evidence he must produce it soon or be branded as he deserves.

If the *Digest* is the mouthpiece of the denial profession, why has not the decree of the court appeared in it? Is the profession not capable of reading it understandingly?

Now, these are some of the reasons why we paid the Crown Company.

C. W. F. HOLBROOK.

NEWARK, N. J.

[The foregoing communication is published that both sides of this controversy may be heard. Some portions of the original communication have been omitted as irrelevant to the main issue.—Ed.]

Notes and Comments.¹

SUCCESS.—Mr. George H. Lorimer, editor of the *Saturday Evening Post*, says of success:

“It is hard to learn what success really is; harder to believe that it has its source in copy-book virtues. A great fortune may mean a great failure; a book which sells a hundred thousand copies may represent wasted effort, or worse. Those for whom all that makes life worth living lies within the circumference of the dollar, those to whom Kipling’s ‘Recessional’ was a great poem simply because he could have exchanged it for a check, will not understand this, nor will they ever grasp the real meaning of success. They will fritter their time away in a vain search for their philosopher’s stone, or in striking off counterfeits of success.

“But for the man who understands that success is simply doing one thing well, the way is clear, the end sure. Blow by blow, through earth and rock, he will toil till a final stroke shall break through to the crumbling quartz and lay bare the yellow ore of realization. Success lies near for some, for others, deep; let who would find it dig.”

USE AND ABUSE OF THE BRAIN.—In the course of an address on this subject, Dr. William A. Hammond recently said, “Anxiety causes more brain disorders than any other agency I know of, unless it be love. Many jokes are made about the gray matter of the brain, but I will say, right here, that I have a great respect for the gray matter of the brain. There is no higher organism in all the universe.

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

"It is well for us to know that the emotions cause more unhappiness and crime than any other function of the brain. Human beings are governed by their emotions, and it is well that they should be, though it is the emotions that wear away the brain, and not honest, intellectual work. It is not intellectual work that causes nervous dyspepsia, but the emotions, such as anxiety, fear, sorrow, and love."

Dr. Hammond says he considers that eight hours are sufficient for a man to use his brain, because if he exceeds that time he becomes nervous and fretful, and an exhausted brain is an irritable brain. You may not feel the evil effects of the stress of brain-work at the time, but you will sooner or later, when it is too late. The men that work at night with their brains are the ones that expose themselves to danger and death, which will surely come unless the great strain on the mind is lightened.

THE COURTS say dental bills should be paid. Why not? A claim was recently filed and allowed in the Probate Court of Chicago, against the estate of the late George M. Pullman for dental services. The bill was for sixteen hundred dollars, and was presented by Dr. J. N. Crouse. It is reported that there were two charges in the bill of twenty-five dollars each for "time lost," and that the judge, in passing the bill, said, "Well, I suppose Mr. Pullman knew what he was doing when he employed the doctor; the bill is allowed."

DEATH TO MOSQUITOES.—*The Public Health Journal* says that it requires two and one-half hours for a mosquito to develop from its first stage, a speck resembling cholera bacteria, to its active and venomous maturity. The insect in all its phases may be instantly killed by contact with minute quantities of permanganate of potassium. It is claimed that one part of this substance in fifteen hundred of solution distributed in mosquito marshes will render the development of larvae impossible; that a handful of permanganate will oxidize a ten-acre swamp, kill its embryo insects, and keep it free from organic matter for thirty days at a cost of twenty-five cents; that with care a whole State may be kept free of insect pests

at a small cost. An efficacious method is to scatter a few crystals widely apart. A single pinch of permanganate has killed all the germs in a thousand-gallon tank.

LIQUID AIR AS AN APPETIZER.—The story is reported in the *Bulletin of Pharmacy*, and comes from a Russian physician who placed a dog in a room with the temperature lowered to 100° F. below zero by the use of liquid air. After ten hours the dog was taken out, alive and with an enormous appetite. The physician tried the test himself. After ten hours' confinement in an atmosphere of still, dry cold, his system was intensely stimulated. So much combustion had been required to keep the body warm that an intense appetite was created. The process was continued on the man and the dog, and both grew speedily fat and vigorous; it was like a visit to a bracing northern climate.

DR. BOGUE'S METHOD OF TREATING SENSITIVE DENTINE.—In sensitive dentine, when patients are extremely timid, Dr. Bogue dips a pledget of cotton into carbolic acid and then into powdered cocaine, and places it in the cavity. This, he says, will obtund the sensibility enough to use granulated chloride of zinc with little or no pain. In ninety seconds the insensibility of the cavity is complete.—*Dental Brief*.

POLISHING FILLINGS.—Keep a cake of calcined magnesia in the cabinet, and when the last disk of cuttlefish is used touch it to the cake and give a brilliant polish to the filling.—*Dental Hints*.

THE PERAMBULATING PRESCRIPTION PEDLER is again abroad, offering to sell "office rights," etc. We have seen copies of these prescriptions. The only thing original about them is that they contain dangerous proportions of a dangerous drug. It is a small sort of business for even mean men to engage in, or for even mean men to buy.—*Dominion Dental Journal*.

REFINING GOLD SCRAP.—To those dentists who wish to refine their gold scrap themselves, the following plan is recommended: The scrap should be dissolved in a small quantity of nitro-muriatic acid,—warming hastens the solution; the solution should then be diluted with about three times its volume of water, and nearly neutralized by adding a small quantity of sodium carbonate. The solution should remain slightly acid, or the gold will be precipitated; in that case redissolve by adding a few drops of nitro-muriatic acid. Filter the solution, washing it through with water, then add slowly while stirring a concentrated solution of ferric sulphate, acidulated with a little sulphuric acid. Set the solution aside for twenty-four hours, so that all the gold is precipitated, then decant the liquor through filter-paper to catch any particles of floating gold, wash the precipitate out of the vessel into the filter, palter, roll up the paper, and fuse with plenty of flux.—*Dental Office and Laboratory.*

Current News.

IMPORTANT NOTICE

At the last meeting of the Dental Commissioners of Connecticut it was

Resolved, That after January 1, 1900, every applicant for license, whether graduate or non-graduate, be required to pass a thorough examination, both theoretical and practical, the details of which shall be arranged later, and that all rules conflicting therewith be and are hereby repealed.

The recorder was requested to devise some plan whereby operations can be performed by applicants upon patients before the commissioners.

Full particulars as to the required examination will be given each candidate as soon as possible before the next examination, which will be held Monday, May 21, 1900, at the Capitol in Hartford. It must be distinctly understood by all applicants who receive a temporary permit after January 1, 1900, that the examination passed to obtain the same does not exempt them from passing

the regular examination for license at the next meeting of the commission.

GEORGE L. PARMELE,

Dental Commissioner and Recorder.

HARTFORD, CONN., January 1, 1900.

UNITED STATES CIRCUIT COURT, SOUTHERN
DISTRICT OF NEW YORK.

THE INTERNATIONAL TOOTH-CROWN COMPANY *vs.* JAMES ORR KYLE.

TOWNSEND, District Judge. Final hearing on bill and answer raising questions of validity and infringement of complainant's Patent No. 238,940, issued March 15, 1881, to James E. Low, its assignor, for an improvement in dentistry.

This patent has already been before this court in the suit of this complainant against Richmond, 30 Fed. 775, where the patent was sustained, and in its suit *vs.* Bennett, 77 Fed. 313, where the Circuit Court and Court of Appeals held that the patent was anticipated. The opinions in said suits show the character of the patented invention and discuss the issues involved. On the argument of this case the two defences presented were denial of infringement and anticipation. The claims alleged to be infringed are the following:

"1. The herein-described method of inserting and supporting artificial teeth, which consists in attaching said artificial teeth to continuous bands fitted and cemented to the adjoining and permanent teeth, whereby said artificial teeth are supported by said permanent teeth without dependence upon the gum beneath.

"2. An artificial tooth cut away at the back, so as not to present any contact with the gum, except along its front lower edge, and supported by rigid attachment to one or more adjoining permanent teeth, substantially as and for the purpose set forth."

The admission of defendant as to infringement is as follows:

"It is admitted by defendant that within the period of two years last past, and prior to the commencement of this suit, in the City of New York, N. Y., in the regular course of his professional work, he performed an operation in dentistry, in all respects similar to

that illustrated by the model marked 'Model of Infringing Operation,' of which the following is a description:

"Inserting and supporting artificial teeth in the mouth of a patient by attaching said artificial teeth to continuous bands fitted and cemented to the adjoining permanent teeth, whereby said artificial teeth were supported by said permanent teeth without dependence upon the gum beneath; each of these artificial teeth in this operation was cut away at the back, so as not to present any contact with the gum, except along its front lower edge."

The exhibit which illustrates said operation clearly shows infringement, especially as such described method and completed structure come within the specification and claim of the patent in suit as construed by Judges Wallace and Shipman in the Richmond case. The following extract from said opinion sufficiently establishes this point:

"By the method of the patent a plate is dispensed with when some natural teeth remain, and, instead of the artificial teeth being loosely clasped to the adjacent natural teeth, they are attached with strength and permanency, and are not forced into contact with the gum during the strain of mastication. . . . When the artificial teeth employed have their surface adjacent to the gum cut away at the back, and only descend to contact with the gum along the front edge, another advantage results; because the small area covered by the bases of the teeth precludes such an accumulation of food or other foreign matter between the gum and the denture as cannot be readily removed.

"The second claim includes with the elements of the first claim, the features of a tooth cut away at the back. Thus construed defendants infringe both claims of the patent."

The first contention in support of the defence of anticipation is, that there were two applications for two distinct inventions, and that the latter invention, not conceived until after May, 1880, was anticipated.

Counsel for defendant says,—

"Low's first application was simply a wall over a space, having and resting upon the jaw for a foundation. His second application upon which patent in suit was granted, was a bridge thrown across a space, not only held in place, but supported by the abutment, or abutments, without gaining any support otherwise. An entirely different principle."

But this precise question was before the judges in the Richmond case, and was exhaustively discussed and finally disposed of as appears from the following citation :

“The defence is relied on that the invention had been in public use for more than two years before the application for the patent. The proofs show that operations were performed by Low during the latter part of the year 1877, in which he inserted the dentures of the patent in the mouths of patients. As the application upon which the patent was granted was not filed until December 20, 1880, the defence would be established were it not for the fact that Low had made an application, which was filed in the Patent Office January 6, 1879, which had never been abandoned, for substantially the same invention. That application contained some matters foreign to the subject of the second application, but, so far as it related to the inventions covered by the claim of the patent, it did not differ from the second application, except in a single particular. The specification of the patent states that non-contact of the artificial tooth or denture carried by the bridge with the gum, or the absence of pressure on the gum, is one of the advantages of the invention; while it was stated in the first application to be necessary ‘to carefully fit the base of the tooth or block to be inserted to the jaw, and when secured, it should be so pressed down as to leave no space beneath it for the admission of food.’ The statement in the first application is not inconsistent with the method of the patent, which consists in attaching the artificial tooth, or the denture, to bands and supporting them by the adjoining permanent teeth, ‘without dependence upon the gum beneath’—so long as this essential feature of the invention is retained, it is quite immaterial whether the artificial dentition ‘is so pressed down as to leave no space beneath it for the admission of food,’ in the language of the specification, or whether it is in positive non-contact with the gum. When the artificial denture is in non-contact with the gum, cleanliness is facilitated, and the suggestion which was first made in the second application was, therefore, a useful one. But it did not change the invention in essentials. Although the tooth or denture is pressed down so close to the jaw that food cannot lodge between it and the gum, it is still supported by the adjoining tooth or teeth and not by the gum. As was stated in the first application, ‘the yielding surface on which it rests will readily conform to the tooth or block, and any pain at first induced by the pressure will disappear.’ There

is nothing to indicate that Low intended to abandon his first application."

To further support the defence of anticipation, the defendant has introduced the same witnesses who, and the same exhibits which, were before the court in the Bennett case. The inexplicable contrast between the statements of the same persons in the two cases is either an object-lesson as to the fallibility of human memory, and the uncertainty of human testimony, or is forcibly suggestive of perjury and fraud. The only question discussed in the Richmond case was anticipation. Upon that point the opinion of the Circuit Court of Appeals contained, *inter alia*, the following statement:

"If the patent were valid the insertion of a single artificial tooth firmly secured to a band of gold accurately fitted and cemented to a natural tooth adjacent to the vacant space to be filled with such artificial tooth, and wholly supported by its attachment to such adjacent natural tooth without dependence on the gum beneath said artificial tooth, would be an infringement. If this were done before the application for the patent it would be an anticipation. The evidence that this is what was done in the case of Mrs. Martz is to our minds clear and convincing, the date is established beyond a doubt, and it is equally certain that the artificial tooth thus attached was used for years. We concur, therefore, with the judge who heard the cause in the Circuit Court that the so-called 'Beardslee-Martz 1877 Permanent Bridge' is an anticipation of the device of the patent."

The evidence in support of this finding is stated by Judge Wheeler, as follows:

"Dr. Beardslee testifies to making a similar cap of gold and attaching it to the natural tooth of a patient, wife of a clergyman, and to attaching at first an artificial tooth to one side of the cap, and afterwards another on the other side, which were worn, and gave satisfaction, several years. In this he is corroborated by an assistant, also learning the profession, and by the patient, her two daughters, and one of her Sunday-school scholars.

"There is nothing so improbable about this testimony, which is left wholly undisputed, as to leave any fair doubt as to the occurrences, or their date, both of which preceded Low's invention. The method of either seems to be the method of the patent and either seems to well have anticipated it."

In the present suit not one of these witnesses is able positively

to identify said exhibit, and the "wife of a clergyman and her two daughters" now testify after an examination of church records, etc., that they were mistaken in their former testimony, and that the cap was not put into Mrs. Martz's mouth until 1878, or until after the Low invention was completed, as found in the Richmond case and further proved herein. Even Dr. Beardslee now says that he cannot now testify that said work was done any earlier than the year 1878, and that, so far as he knows, the testimony of the Martzes as to the date when it was done is correct. And further, as if to cap the climax of these contradictions, an apparently disinterested witness, Dr. Palmer, testified that he himself made the Beardslee-Martz exhibit, and was told at the time that "whatever of the kind I did was for use in defending the suit of the International Crown Company." It is unnecessary to further discuss this branch of the case.

At the conclusion of the first day's argument, counsel for complainant for the first time learned that the defendant herein was related to one of the officers of the complainant corporation, and that one of its stockholders had contributed to the defence herein without the knowledge of counsel for defendant. Counsel for complainant at once fully and frankly brought this matter to the attention of the court, and asked to be advised thereon. The questions thereby suggested have been borne in mind in consideration of the evidence herein. These circumstances, however, cannot relieve the court from its obligation to pass upon the question of fact presented by the evidence herein. The commendable frankness of counsel in the disclosure of these conditions has put the court on its guard against anything which might suggest collusion. The defence of anticipation herein is overwhelmingly disproved by disinterested witnesses. The methods by which the Beardslee-Martz evidence of anticipation was secured by Dr. Beardslee in the Richmond case appear to have been questionable and reckless, and it is hoped such practices are unusual. The contradictions in his own testimony are so direct and material as to disentitle him to any consideration. The Martz witnesses appear to have testified incorrectly as to the date when the work was done, because, as they say, "We were taken at such short notice we hadn't time to look accurately," or because "Dr. Beardslee was so sure that we came in 1877 that I thought it must be so," because they thought he had a record of such dates.

By reason of other contradictions in Beardslee's testimony, it

appears that, even if the Beardslee-Martiz device had been prior to the patent in suit, it would not have anticipated it, because it was supported on a root which was not taken out. Day's testimony has not been discussed because his veracity is attacked, his testimony is contradicted, and the facts stated by him, if true, would be insufficient for various reasons.

A decree may be entered for complainant for an accounting but not for an injunction, as the patent has expired.

DICKERSON & BROWN,

JAMES C. CHAPIN,

For Complainant.

ANDREW COMSTOCK,

For Defendant.

KENTUCKY STATE DENTAL ASSOCIATION.

ATTENTION is called to the change of date of the meeting of the Kentucky State Dental Association. On account of change of meeting of Confederate Association, and for the purpose of getting railroad rates, we too have changed our date to May 29, 30, 31. We have some thirty papers promised for the meeting and nearly as many clinics, and we will still add others to the list.

F. I. GARDNER, D.D.S.,

Secretary.

LOUISVILLE, February 2, 1900.

ILLINOIS STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting will be held in Springfield, May 8 to 11, inclusive.

Drs. E. H. Allen, Executive Committee, and J. E. Hinkins, Supervisor of Clinics, promise an excellent programme, which will be printed in the May number of this journal.

All reputable dentists are cordially invited to attend.

A. H. PECK,

Secretary.

92 STATE STREET, CHICAGO.

LEBANON VALLEY DENTAL SOCIETY.

THE Lebanon Valley Dental Society will hold its annual meeting at the Allen House, Pottsville, Pa., May 15 and 16, 1900, to which all dentists are invited.

P. K. FILBERT,
Chairman Executive Committee.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

THE twenty-fifth annual meeting of the Association, at Chicago, was in every respect the most successful meeting in the history of the organization. Despite the many distractions of a large city, the meetings of the Sections were universally well attended, and a larger percentage of those down for papers were present to read them than ever before. The discussions were full and to the point, and on this account the volume of Transactions that will be issued at once will be very valuable. The following were appointed a Committee on Publication: Drs. Henry E. Tuley, Dudley S. Reynolds, and Lewis S. McMurtry. Those on the programme who have not handed in their papers must do so before November 1, after which time no paper will be received for publication.

The Executive Committee has ordered that no volume be sent a member who is in arrears for dues.

The following officers were elected for the coming year:

President, Dr. Harold N. Moyer, Chicago, Ill.; First Vice-President, Dr. A. H. Cordier, Kansas City, Mo.; Second Vice-President, Dr. S. P. Collings, Hot Springs, Ark.; Secretary, Dr. Henry E. Tuley, Louisville, Ky.; Treasurer, Dr. Dudley S. Reynolds, Louisville, Ky.; Chairman of Committee of Arrangements, Dr. M. H. Fletcher, Asheville, N. C.

Twenty-sixth annual meeting, Asheville, N. C., October 9, 10, 11, 1900.

HENRY E. TULEY,
Secretary.

THE

International Dental Journal.

VOL. XXI.

MAY, 1900.

No. 5.

Original Communications.¹

A SUSPENSION CROWN.²

BY HORATIO C. MERIAM, SALEM, MASS.

BESIDES the personal advantage gained by reporting cases like the one I bring before you to-night, there is also the satisfaction that we are making a record that may be of more value in the future than can be measured at the present. There can hardly be better evidence than the files of scientific journals, and by making our journal one of record we are recording now evidence that may in the future aid some dentist in his fight with the companies that will be formed on devices and operations. Some years since, Dr. Rollins, of Boston, in an article on porcelain inlays, gave a cut and a description of a bur made for him as ordered. He little thought, perhaps, in printing this in a medical journal, that some years after the record there made would be evidence sufficient to decide the right to make instruments. Had editors of that day kept in touch with correlated scientific journals, and made their journals journals of record for our advantage, they would have figured the new in-

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, February 3, 1900.

vention and so saved instrument-makers from loss in entering upon vexatious law-suits, in ignorance that the claim had been invalidated by previous invention and record.

It is pleasant to think that a Harvard graduate has given us improvements free of patents, if another Harvard graduate has helped to form the Tooth-Crown Company.

A short time since I was called to treat the case shown (Fig. 1). A first bicuspid had split, and much absorption of the alveolar had followed, which shows perhaps more plainly in the palatal position of the cast. An extension crown was inserted,¹ but a new device was needed to guard against the working down of the first superior molar, and to aid the muscles of mastication to perform their function. I wished to make an appliance easily cleaned and one that could be made without cutting the molar or bicuspid. These teeth were banded and the band reinforced. Our president, Dr. Bogue, has kept the tipping of the molars that follows extraction and consequent loss of occlusion well before us. The tipping in this case was made use of, and part of the forward portion of the band covered to prevent its working down. In a subsequent case I made a strong nodule of gold here to occlude with the upper molar. The bicuspid had been previously cut away, but the mesial and distal points of the band were bent to partially cover. An impression was then taken with the bands in place. (Fig. 2.) A large countersunk molar was selected and ground to a taper. (Fig. 3.) A wide, tapering gold band was made for this tooth (Fig. 4); the band held upright on a lead anvil, the tooth was then placed in the band, protected by a piece of air-chamber tin, and driven to a fit. This can also be done by holding the tooth and band in a strip of the air-chamber tin folded. The whole rested on a block and the tooth struck into place. (Fig. 5.) (For making bands that are to be spread in this way, or that require fitting to teeth where there has been recession of the gum, a firm gold should be used, as a soft gold may not stand up firmly when the tooth is driven, nor hold an irregular line.) The tooth and band were then placed against the upper molar and the band waxed in position against the molar and bicuspid. (Fig. 6, *a* and *b*.)

The tooth was then removed and the band fastened in place on the cast by filling it with investing plaster, allowing this to

¹ See INTERNATIONAL DENTAL JOURNAL, March, 1899.



Fig. 1



Fig. 2



Fig. 3



Fig. 5



Fig. 4

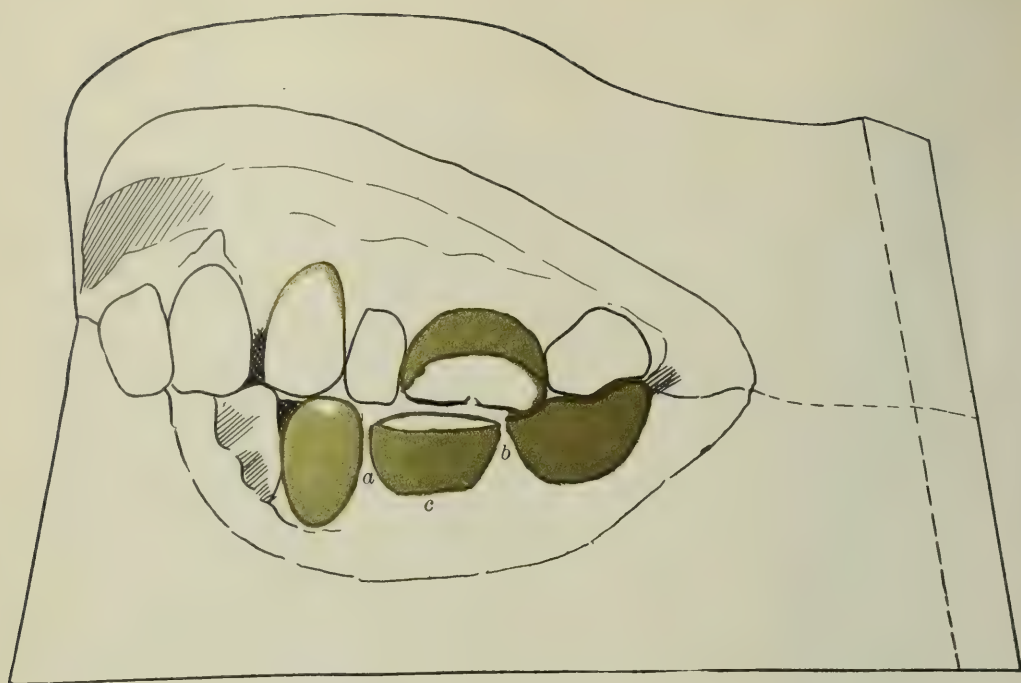


Fig. 6

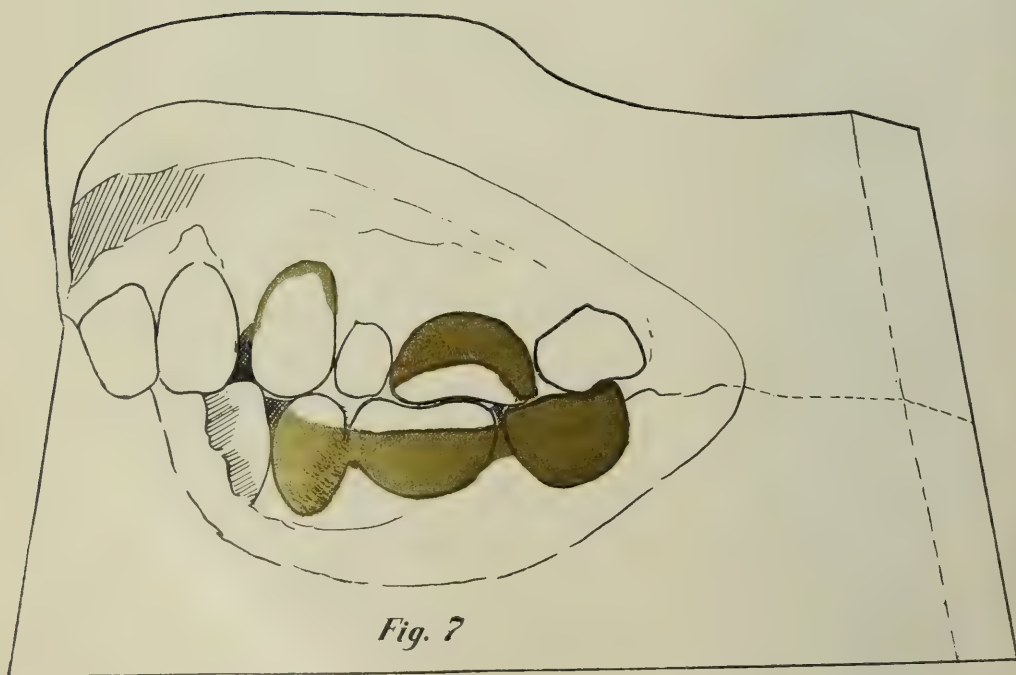


Fig. 7

run through and around its lower portions. (Fig. 6, c.) It was then lightly soldered to the other bands, removed from the cast, and the soldering completed, working on the underside. I have since removed from the cast after waxing, and invested the whole with the underside uppermost, showing only the wax, soldering but once.

The cap for holding the tooth is completed by soldering a small cap on its base. This little cap is easily made from a disk by striking with a round-headed punch into the lead anvil. The case was then ready for finishing and polishing.

The crown was set with oxyphosphate cement, and the bands filled with softened gutta-percha and forced into place. I have since varied the operation somewhat to suit different cases, but the essential principle is, I think, covered by what I have shown to-night. (Fig. 7.) You will see that all parts can be reached by a brush, and that it can be kept polished and clean by the patient.

Other specimens that I pass around may be of interest as showing the line of work, but the evening is too full to describe them.

HÆMOPHILIA.¹

BY CHARLES A. PORTER, M.D., BOSTON, MASS.

IN connection with the case which Professor Fillebrown reports to-night, he has asked me to read to you a short paper on the general surgical aspects of hæmophilia, a disease which interests alike the dentist and the general surgeon.

Fortunately this disease is a relatively rare affection, but, as in tetanus, the appallingly fatal results which may follow trivial wounds make it wise for us all to understand something of the general symptomatology of the disease, and to know at least where further knowledge may be acquired on occasion.

In the literature scattered cases are found, dating back as far as the eleventh or twelfth century, where excessive or fatal hæmorrhages followed slight wounds; but it was not until 1875, when Schönlein collected and described a number of cases, that the dis-

¹ Read before the American Academy of Dental Sciences, December 8, 1890.

ease received its present name. Three men in particular have written monographs on the subject,—Grandidier, Immermann, and J. Wickham Legg. His last article, in Albrett's "System of Medicine," is the most recent and comprehensive description of the disease which I can find. Early in the present century several shorter papers appeared from American authors, and the popular term, "bleeder," first arose on this side of the water.

Legg defines hæmophilia as "a disease congenital and hereditary, marked by a tendency to immoderate bleeding on slight causes, lasting generally through the life of the patient, and further accompanied by joint-affections, which are often as wearisome to the patient as the tendency to external hemorrhages is dangerous." From this definition it can be seen that hæmophilia proper means much more than a single severe hemorrhage from slight cause, and has nothing to do with bleedings in anæmia, Bright's disease, scurvy, or jaundice, and is different from the hemorrhages in the new-born which do not tend to recur in later life.

It can be stated with truth that hæmophilia is, of all diseases, the most hereditary; *e.g.*, in Tenna, in Switzerland, the affection has been traced back in two families for three hundred years. In the Appleton-Swain families, in Reading, Mass., cases have occurred for nearly two hundred years; and F. F. Brown is quoted by Osler as knowing of a case in the seventh generation. Several cases have been reported where all the male children have died; as bleeders are remarkably prolific, this usually means a large mortality. In one family all the male children died before reaching the age of ten.

Furthermore, the mode of transmission is extremely interesting. This disease affects males much more frequently than females, in the proportion of twelve to one; yet it is through the female line that the disease is almost always transmitted: in a given family the sons are bleeders, the daughters generally healthy; in the next generation the sons of the daughters are bleeders, while the children of the male bleeder are free. Not all the children, as a rule, are affected, but two or three brothers may suffer.

While by the older writers the Anglo-Germanic races and the Jews were thought to be peculiarly susceptible, it now seems doubtful whether race plays a very important part. Recently cases are reported among the natives of India and Japan.

The time of life at which the hemorrhages take place is vari-

able: rarely in foetal life unusual blood extravasations are reported; in the first few days bleeding is more frequent, and ritual circumcision among the Jews, celebrated on the eighth day, has often proved fatal in hæmophilic children. It is interesting to note that the women in bleeder families, contrary to what might be expected, rarely suffer from profuse menstruation or unusual loss of blood at childbirth.

The hemorrhages in hæmophilia may be spontaneous or traumatic; from the mucous membranes; into the skin or subcutaneous tissues; into the joint cavities; from the internal organs, as hæmaturia of renal origin; and finally, from any wound, ulcer, or abrasion of the skin, however trivial,—a pin prick, cutting the frænum of the tongue or penis, boring the ears. In childhood, epistaxis is the most common manifestation; next come large ecchymoses and subcutaneous hæmatomata, with or without preceding injury. In later life, hemorrhages from the internal organs, and especially recurrent hemorrhages in the joints or periarticular tissues.

The periods especially liable to hemorrhage are the first and second dentitions and puberty. In the great majority of cases some manifestation of the inherited disease has occurred before the fifth year. Grandidier reports one hundred and fifty-two cases in boy bleeders, where eighty-one (more than fifty per cent.) died before the eighth year. Patients rarely die from the first hemorrhage. At or about twenty-one is another danger period. When middle life is passed the disease tends to abate, and rarely the diathesis seems to be completely outgrown.

This tendency to hemorrhage is undoubtedly variable in a bleeder: a given injury at one time will cause severe loss of blood; at another a similar wound behaves as it would in a normal individual. Damp seasons, exposure to cold, nervous excitement, are factors often spoken of, influences, however, which are always open to question.

Probably these joint-affections have erroneously led to the conclusion that this disease was related to rheumatism, or *purpura rheumatica*. More than once knees have been excised by surgeons, with fatal results, under the belief that the joint lesion was tubercular.

Of especial interest to you, of course, are the frequent hemorrhages after operations in the mouth, especially after the extraction

of teeth; and tooth-pulling in bleeder families has always been a procedure which the dentist has wished to relegate to his confrères. This trivial operation was four times fatal in one family, and by most authorities is considered unjustifiable except under very peculiar circumstances. The opening of alveolar abscesses has proved more dangerous than allowing them to rupture spontaneously. While it is manifestly impossible for busy dentists or surgeons to inquire in out-patient clinics in regard to hæmophilia, it is certainly obligatory that every physician who has treated a bleeder should carefully explain to the patient or his family the grave danger he runs from any future operation.

The points in the past history of a suspected case to be inquired about particularly are excessive hemorrhage from trivial wounds,—lancing the gums, nose-bleed, large recurrent ecchymoses, so-called rheumatism in the joints without fever, hemorrhages from internal organs. A family history of bleeding will, of course, be of great value.

The amount and rapidity of hemorrhage in these cases varies considerably. A sharp loss of blood may immediately follow the extraction of a tooth, which rapidly exsanguinates the patient; or the blood may clot normally at first and the bleeding cease, to be followed by a continuous slight ooze in spite of the usual treatment, which at the end of days, or even weeks, reduces the patient to a condition of severe anæmia, or proves fatal. From this condition patients not infrequently slowly recover just as their life is despaired of; indeed, some physicians believe that true cases of hæmophilia rarely stop bleeding until almost dead, and, having in other cases tried in vain the usual remedies, calmly await this period.

With regard to the pathology of the disease very little is known. In the majority of autopsies nothing unusual has been found either in the blood or tissues. Some investigators speak of abnormally small arteries, thinning of the middle coat, fatty degeneration of the intima and media. These later changes can be satisfactorily explained by the severe anæmia before death. Some find in fresh cases an increased number of white cells; others nothing abnormal. The leucocytosis in late cases is that which accompanies all grave hemorrhages. Wright, in certain cases, has found that the blood coagulated very slowly, and attributes to this the continuous flow of blood, theoretically due to deficiency of the lime salts or nucleo-

albumins. In support of this theory, some bleeder children have undoubtedly an abnormal craving for plaster.

That this delayed coagulability is not always present is shown by the fact that not infrequently a normal clot is formed; yet this is later washed away by the capillary ooze about it. It seems, therefore, that the real lesion must be situated in the capillaries or small arterioles, for here normal thrombosis does not occur, though the blood which flows from the wound may clot in the vessel. Patients with hæmophilia are apt to be very thin skinned, neurasthenic, liable to sudden flushings and vasomotor disturbances; it may be that some hereditary deficiency exists which interferes with the action of the vasoconstrictors.

With such an indefinite, irregular, or unknown pathology, it is evident that our treatment must be chiefly empirical, yet always directed towards the formation of a clot *in the vessel walls*. The multiplicity of remedies suggested and tried speaks for their frequent uselessness. I shall speak, therefore, only of those which have been found successful, or at least rest on some rational basis. The female members of a bleeder family assume a serious risk for their offspring by marriage. Bleeder children should be protected in every way from injury.

Whether iron and other tonics, particularly sulphate of soda, as advocated by Legg, much affect the disease is open to question, but those physicians who have had charge of bleeder families feel sure that bland, unirritating diet, frequent catharsis, and a quiet, unemotional life, with change of climate, have favorably influenced the recurrence of hemorrhage. What interests us most, however, are the measures which may be taken to stop an actual hemorrhage. It is difficult to gather from the literature a definite opinion as to the real efficacy of the ordinary styptics given internally or applied locally, for after the administration of certain drugs it is often hard to determine whether the hæmophilia ceased because of their administration, or spontaneously. Ergot seems inefficient. It seems also doubtful if iron, given internally, can effect the coagulability of the blood. The two drugs which are spoken of most favorably are *hydrastis canadensis*, in doses of thirty minims every four hours, especially valuable in spontaneous hemorrhage from internal organs, and dilute sulphuric acid, twenty minims in an ounce of water four times a day. Sidal used the latter drug successfully in three cases, and stopped the hemorrhage in

forty-eight hours, whereas the cases had previously bled to exsanguination. Perhaps the administration of calcium chloride is the most scientific treatment. Wright and J. Clifford Perry both report cases where this drug was used with wonderful success: one a man of twenty, alveolar abscess, incision one-eighth of an inch long, profuse hemorrhage in spite of pressure and styptics. He had several times bled until he fainted. Two brothers had died in infancy after trivial wounds. Calcium chloride was given in grain doses every two hours, and after three doses the blood formed a firm clot. Wright reports one case in which the coagulation time exceeded fifty-four minutes. After two drachms of calcium chloride had been given at two-hourly intervals, the coagulation time was reduced to twenty-five minutes, and after two more doses, to thirteen and one-half minutes. In a normal case the coagulation time was reduced, after a few doses, from fourteen minutes to six and three-fourths minutes. This drug is therefore worthy of trial. But in Dr. Fillebrown's case, and several others, no benefit resulted.

Inhalations of carbon dioxide gas have been successful; so, too, continuous inhalations of oxygen. Though the dangers and difficulties of transfusion of human blood are very great, I see no reason why it should not be done as a last resort. Fry in the *New York Medical Record* of July 3, 1898, reports three very interesting and successful cases where he infused normal horse serum. One patient received in all three hundred cubic centimetres; the improvement was remarkable, hemorrhage ceased, and no harm resulted from these injections.

Whichever of these general measures the surgeon chooses to adopt, there is no doubt that absolute quiet should be insured to the patient. Davies, who has had marked success with two hæmophilic families, placed the patient, immediately on the occurrence of hemorrhage, in a dark, quiet room, forbidding conversation, and withholding food entirely for two days. The hunger is relieved by small doses of opium, the thirst by a little ice-water. He has had no success with any general or local styptics whatever.

The local measures may be divided into pressure and styptics. It seems of great importance that before pressure is applied the cavity should be thoroughly cleared of clots. Finger pressure is most intelligent, but has usually to be supplemented by whatever mechanical device the dental surgeon can devise. The best local

styptic is gauze dipped in perchloride of iron and firmly packed into the cavity. The jaws may be held together with elastic bands or an interdental plate or splint fitted. A wooden or cork peg has been driven through the gauze into the alveolus with success, but unfortunately oozing often occurs subsequently from the ulcerated gum. There are those who believe that the frequent traumata in connection with packings induce fresh hemorrhage, and do more harm than good. Antipyrin solution, twenty or thirty grains in the ounce, applied on absorbent cotton, is a powerful styptic. The actual cautery, which often temporarily arrests the bleeding, rarely is of permanent benefit. Hydrogen peroxide is a valuable styptic. Davies, whom I have quoted before, has had remarkable success with ethyl chloride. Immediately after the extraction of the tooth he freezes the clot with a spray, and maintains this condition for several minutes. In many cases he has not failed to arrest the hemorrhage. Normal human blood has been poured into the wounds of hæmophilic patients, and successes have been reported. General cardiac stimulants, unless absolutely demanded, are definitely contraindicated, especially alcohol. It is hard to see of what use salt infusion can be, for the previously diluted blood would be rendered thereby more incoagulable.

These are the measures which appear most useful:

1. Absolute quiet.
2. No food for two days.
3. Opium in small doses.
4. Internally: (1) Dilute sulphuric acid; (2) *hydrastis canadensis*; (3) calcium chloride.
5. Serum infusion or direct blood transfusion only as a last resort.
6. Locally: (1) Clearing out the clot; (2) freezing with ethyl chloride; (3) antipyrin or peroxide; (4) normal blood for clotting.
7. And finally, pressure evenly and firmly applied by whatever device will cause least disturbance or sloughing.

If in spite of these measures, carefully and thoroughly carried out, the patient dies, the surgeon has done all in his power, and as I have said, most cases come near to death before the hemorrhage ceases.

A FATAL CASE OF HÆMOPHILIA.¹

BY THOMAS FILLEBROWN, M.D., D.M.D.


A PATIENT, male, aged twenty-five years, was suffering from an alveolar abscess on the distal root of the left inferior first molar, which was discharging through a fistula on the side of the face near the lower border of the under jaw. The abscess was of three years' standing. The constant discharge from the abscess had become so exceedingly offensive that the patient felt he must have it relieved. He was brought to me by Dr. L. G. Forrest for operation, April 26, 1899.

Some months previous Dr. Forrest had consulted me about the case, and had given me quite a full description of the trouble. I then advised that when the patient decided to have the tooth removed, he should take a course of astringent tonic for some two weeks just previous to coming for the operation.

I based this advice upon the fact that I had in several cases pursued this plan with my own patients, and the best of results had followed; and had the state of the blood in this case been the only condition unfavorable, it evidently would have proved sufficient, for the blood proved to be readily coagulable, forming a clot firm and disposed to be adherent; and had the arteries had any contractile power, I am sure success instead of defeat would have been the result.

On Wednesday, April 26, I extracted the roots of the first and also of the second molar, all of which were decayed to the gum and quite loose. The roots were removed without difficulty. The bleeding was somewhat profuse, but not excessive, and soon ceased. After a time he went out a short distance and took a light lunch. He returned to my office, and in about an hour and a half after the operation the blood commenced to flow again.

I plugged the sockets with cotton and Monsel's persulphate of iron, but I could not control the bleeding. I then took a plaster impression of the under jaw and made a hard rubber jacket plate, which, when applied with a layer of gauze under it and held in place by a firm head bandage, controlled the bleeding apparently

¹ Read before the American Academy of Dental Science, December 9, 1899. 

for six hours or more, when it had to be readjusted, as the blood had worked its way out under the compress.

He then went to the Elliott Hospital, in order that he might have careful nursing and timely attention.

The second adjustment of the splint held the blood in check for about six hours more, when the blood flowed freely again.

At noon of Thursday, the 27th, as the upper teeth had become quite sore, I concluded to try the Harvard dental splint, and with the assistance of Mr. Curry, one of the students of the Harvard Dental School, made a jacket and applied the splint at five o'clock p.m. This seemed to promise success, as it held the blood in check for twenty-two hours, when this also failed.

I then packed with gauze and cotton, holding it down by the upper teeth. I renewed these packings every five or six hours, as that was as long as any one application would serve; and the large amount of clot that came from the mouth and throat when the packings were removed showed plainly that the flow of blood had only been retarded and not stopped.

On Sunday, April 30, I decided to try the actual cautery, and at about three o'clock, with the assistance and advice of Dr. F. W. Rice, I thoroughly cauterized the bleeding surface, which was confined to the edge of the gum opposite the mesial root of the first molar on the lingual side. A firm clot covered the other parts of the wound and completely stopped the blood. The cautery, supplemented by nitrate of silver, completely checked the flow of blood, and we thought the victory won. In about an hour the blood-pressure removed the eschar, and the blood again flowed as freely as ever.

I resorted again to the compress, but had more difficulty in controlling the hemorrhage. At eleven o'clock p.m. I called Dr. Brewster, who advised with me, making valuable suggestions and rendering assistance, which kept the trouble fairly well controlled through the night. Dr. C. A. Porter was also present, and at his suggestion and advice I gave the patient a full course of chloride of calcium. The effect was not so favorable as we had hoped. Previous to this I had administered ergot in full doses for nearly twenty-four hours, with negative results.

On Monday, May 1, at noon, acupuncture was resorted to. I secured the services of Messrs. Wentworth and Mellaire, dental students, who kindly volunteered for the service, and faithfully and

skilfully maintained pressure during the afternoon and night, but could not succeed in wholly arresting the flow.

On Tuesday, May 2, I was called at two o'clock A.M., as the patient seemed sinking, but it proved to be fainting; and as he seemed too weak to bear more manipulation, the packing and pressure were not resumed.

The only hope now lay in the natural cessation of the flow of blood, as had occurred before when the loss of blood was excessive, and as frequently occurs in similar cases. But it was of no avail, and at 1.30 P.M., Tuesday, May 2, the patient passed away, a victim to the loss of blood. Blood continued to flow from the wound after the pulse at the heart had stopped and the breathing had nearly ceased.

On Monday evening the infusion of a saline solution was considered, and Dr. Brewster was present prepared to perform it. Dr. Porter was also present. Upon consideration, it was deemed inadvisable, as it would add another wound, and the salt would make the blood less coagulable and offer no compensating stimulus to the nervous system which would serve to contract the vessels. The lack of contractility of the arteries seemed to be the main trouble, as the blood formed a very firm clot.

The undertaker gave me the following statement: "I found the arteries in a very abnormal condition. Neither myself nor my assistant could find any trace of the femoral artery or its sheath, and after repeated attempts, gave it up and sought for the left brachial artery, which I found.

"The division of the artery occurred several inches above the normal point. There was hardly a semblance of a sheath, and an almost total absence of the middle coat, which made the artery hardly distinguishable from the vein.

"The walls of the artery were so tender that the pressure of a finger was sufficient to tear it open, whereas in a normal case this is impossible, it often requiring the aid of a scalpel to extend the opening so as to admit the embalming syringe.

"The embalming was done less than six hours after death."

Following is the history of the patient: Paternal grandmother suffered from excessive nose-bleed. Had nares plugged to stop it more than once. Patient's father did not inherit the conditions. Patient's mother inclined to bleed freely.

At seven years of age he suffered from a slight injury to his

left knee, which caused a scratch two or three inches long, but not through the skin. The part swelled enormously until the skin along the line of the scratch burst open. Bleeding followed, but not profuse, which soon reduced the swelling. It was more than a week before the bleeding ceased.

When about twenty-three years old he had a tooth extracted and for nine days the blood flowed constantly, but not enough to keep him from his work. The same year his lip was injured quite severely. It swelled excessively, and bled for three weeks at times before it could be stayed. Ice with a spring clip was the last thing applied. He bled almost to collapse.

When twenty-four the patient had a portion of a tooth hanging by a little gum tissue. It was removed by the pressure of a finger. The bleeding continued long and was stopped with difficulty.

The more noticeable features of this case are the peculiar conditions of the arteries and the progressiveness of the disease. When a baby there was but little trouble, but at seven years of age the disease had become serious, and gradually increased until at twenty-five it proved irremediable.

CONSEQUENCES OF THE EXTRACTION OF PERMANENT TEETH.¹

BY E. A. BOGUE, M.D., NEW YORK, N. Y.

MR. PRESIDENT, AND GENTLEMEN OF THE MASSACHUSETTS STATE DENTAL SOCIETY,—A distinguished surgeon lately said to me that it seemed a pity that human life must be sacrificed to a considerable extent before any surgeon becomes thoroughly qualified to save life. A modification of this remark seems specially applicable in dentistry. It seems a pity that human teeth must be sacrificed, extensively, before the dental surgeon becomes thoroughly qualified to save them. A recent paper in the *Dental Cosmos*, from a gentleman who deprecates the formation of societies

¹ Read before the Massachusetts Dental Society, June 7 and 8, 1898.

[This paper has heretofore been published, but, with some changes and new illustrations, it is presented as part of the proceedings of the above Society.—Ed.]

of stomatology, saying that it seems like reaching out into regions that do not belong to the dental practitioner, advocates the extraction of the sixth-year molars. In the hope of showing the facts somewhat more clearly than the desultory observations of clinical practice usually show, permit me to draw your attention to a few of the unfortunate results of the extraction of permanent teeth.

Every gentleman present knows perfectly well that the first permanent molars erupt at somewhere near the sixth year of the child's life. It is this fact which has given these teeth the name of sixth-year molars. When fully erupted, these four teeth, two above and two below, sustain the jaws in their relative positions while the deciduous teeth are being shed and replaced by the permanent ones. What short-sighted policy to remove any of these four supports! And yet it has been done at so early a period that plates have been required for the growing child to masticate upon until the second permanent, or twelfth-year molars appear.

In order to comprehend more accurately what takes place when permanent teeth are extracted, we ought to have before us the skull of a child of six years with the temporary teeth in position and with the anterior plates of alveolus removed, that we may see the permanent teeth in process of development. We would see, in the first place, that the jaws at that age are not large enough to hold the permanent teeth in their proper arches. Hence they are packed, in regular irregularity, pending the growth of the jaws and the enlargement of their arches to such size as will admit of the permanent teeth, standing like the stones of an arch, each supporting the other by contact with that other, and all supported in their places by contact with the occluding surfaces of the antagonizing teeth of the other jaw. It should be borne in mind also that as the child grows, and the dental arches enlarge, they expand their alveoli in two ways,—from above down (and from below upward) and from before backward, antero-posteriorly. This is well proved by placing the impressions of the temporary teeth of any child upon the impressions of the permanent teeth of the same child after it shall have grown up. By looking carefully at the positions of the temporary teeth, we find an arch which is a pretty good horseshoe,—that is to say, fairly round from one end of the arch to the other,—and pretty nearly flat, or pretty nearly a straight line from before backward from the incisors to the farther end of the molars. This, by the way, is very much the arrangement

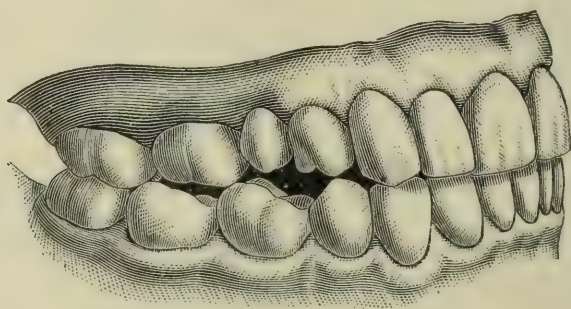
that the artificial tooth-maker contributes to dental art when he makes a horseshoe plate, the grinding and cutting ends of whose teeth would all touch the table if laid upon it; and this is the arrangement produced generally by extracting the sixth-year molars. These temporary teeth, with the simple arch and straight lines, are sufficiently adapted to the mastication of the soft food that constitutes the child's nourishment, but they are not adapted to the necessities of adult life. If all the dental organs, temporary and permanent, are faithfully preserved to fulfil the functions of maturity, the twelfth-year molars of the lower jaw, developing upward, will be a little higher than the sixth-year molars, *because* they will have developed upon the curved lower jaw, which has grown backward and upward beyond what it was when it was the baby jaw. Following the line of that upward curve, the crown of the twelfth-year molar leans forward and pushes against the sixth-year molar at the point where the enamel is thickest, and this is at the greatest tuberosity of the tooth. The wisdom-tooth, when it appears regularly, rises still higher up the curve of the lower jaw than the twelfth-year molar, and leans against the twelfth-year molar in exactly the same relative position that the twelfth-year molar leans against the sixth; but, gentlemen, if that lower wisdom-tooth gets a faulty start and becomes impacted beneath the tuberosity of the twelfth-year molar, we, who have seen patients given up to die because of this trouble, do not need to be told that the developmental pressure from behind of an impacted wisdom-tooth and the forward push of the molars is very great indeed.

Now, to return to the upper jaw, the teeth in which regularly develop later than those below. As these upper teeth develop they descend, and their cusps are meshed in with the cusps of the lower teeth in a manner resembling the cogs of two wheels that intermesh. The upper teeth incline outward, the lower molars and bicusps incline inward towards the tongue, and this results in the upper molars coming down astride of the outer row of cusps of the lower molars and bicusps in such fashion that the largest portions of the superficial areas of these corrugated or cusped teeth are brought into contact and are enabled to slide against each other in the triturating movements of the jaw so as most effectually to comminute the food in the act of mastication.

Please to note carefully at this point that when the development of the molars is complete (and this comprises bicusps or pre-

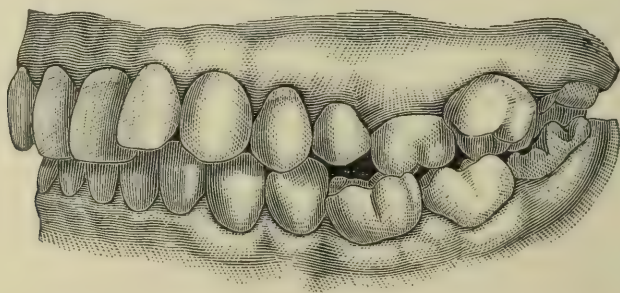
molars as well), the curve of the lower jaw quite represents the concavity of a mortar, while the upper jaw may be imagined to be the convexity of the pestle, both reinforced by corrugations fitting into each other and adapted to do the heavy work of adult life. If now we imagine the removal of one stone or one brick from an arch, the imagination spontaneously sees the other members of this arch falling together. This is just what happens when one member of these complicated dental arches of sixteen members each is removed. Not only do the other members fall together in a different manner from the normal one, but that manner is in conformity to the pressure of development, which pushes from the wisdom-tooth forward to the cuspid, both above and below, while the force of the lips draws backward to the cuspids all incisor teeth above and below. The upper and lower cuspids, therefore, may be regarded as being *the most nearly fixed points* of any among the movable occupants of the mouth. In illustration of the operation of this fixed law of development, and that nature's efforts to repair

FIG. 1.



damage are always exerted along the same lines, I present for your consideration the drawings of two mouths, one of which has lost

FIG. 2.



the right lower bicuspid by extraction, the other of which lost the left lower bicuspid by failure to develop. The results are the same,

and trituration cannot be performed upon the side where the ex-

FIG. 3.



FIG. 4.



traction or the loss occurred. Incidentally let me call attention to the fact that the size of the dental arches being diminished by the

width of one member in each of these cases gives that much less room for the free movements of the tongue, and to the critical

FIG. 5.

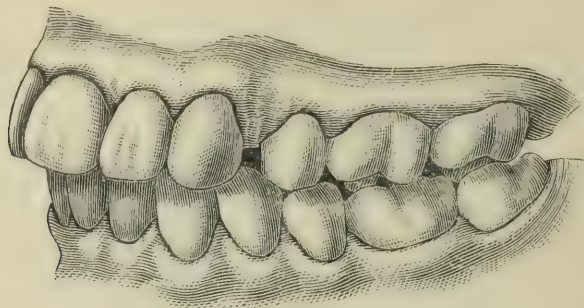
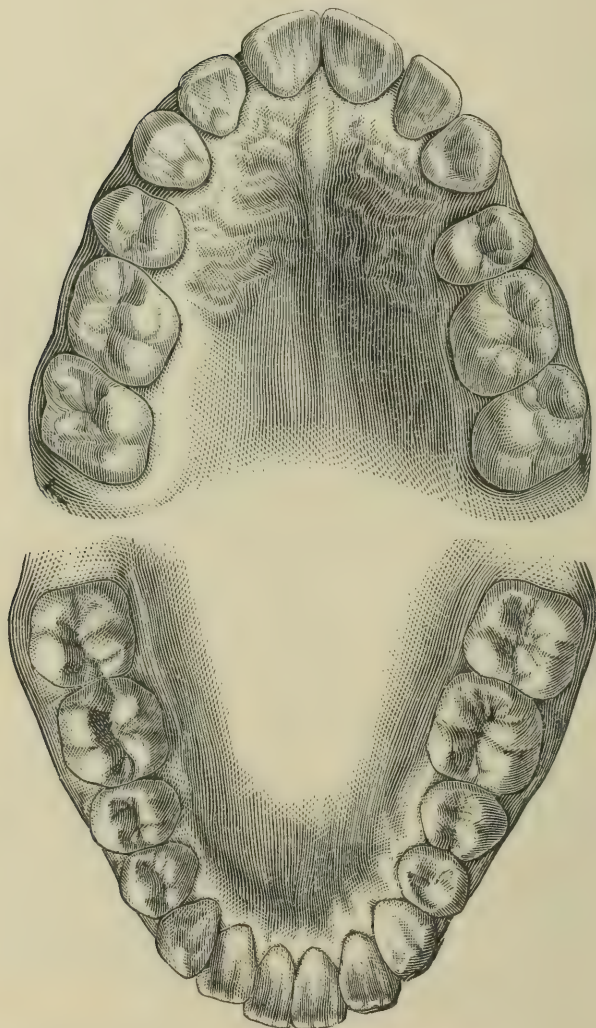


FIG. 6.



observer that side of the face in each of these cases was noticeably smaller than the other. These same conditions appear in the draw-

ings in the *Dental Cosmos* for June, 1899, pages 526 to 530, where all the models shown exhibit a straightening of the horizontal lines of mastication, a return towards the conditions of the temporary teeth, a consequent diminution in masticating power, a shortening of the bite, and, if we are permitted to allude to appearances, a weakening of the expression of the countenance.

A third case, which I present, also had the two first upper bicuspids removed and the upper front teeth drawn downward, spreading the cuspids somewhat. "This regulation took place when the patient was fourteen years of age, at which time, according to my description written then, the lower cuspid stood upright, the lower first bicuspid leaned a little backward, the second bicuspid a trifle forward, so that its tuberosity touched accurately the tuberosity of the first bicuspid. The first lower molar occupied a similar position towards the second bicuspid, and the second molar in turn the same thing towards the first. The meshing of the cusps between upper and lower teeth was good. Mastication and trituration could be performed on both sides of the mouth." The second model of this mouth was taken six years later. The lower incisors lean considerably forward, the lower cuspids are no longer upright, the first bicuspid leans so far forward that the tuberosity of the second bicuspid is below the tuberosity of the first, and almost the same condition exists between the molar and the second bicuspid. The lower arch is distinctly made narrower, and yet it will be remembered that nothing has been extracted from the lower jaw, nor has any tooth been filed. The movement that we see in this case is entirely due to the change in occlusion, which has taken place since removing the natural support from in front of the second bicuspid. We cannot see that the six upper front teeth have gone backward, although I tried my best to make them do so, but we do see that the back upper teeth have come forward, and in their coming forward the change in the lines of contact has been such that the upper teeth have driven the lower teeth forward also, and in that forward movement has occurred a distinct shortening of the bite to the extent seen here.

The third model of this mouth has been made within a few weeks, and is ten years later than the second model. A number of fractures have occurred of the teeth at various points owing to the malocclusion produced by those unfortunate extractions sixteen years ago. The next diagram shows a straightening of the hori-

zontal lines of the dental arches from before backward, so that the concavity of the line of the lower molars and the convexity of the line of the upper molars is scarcely, if at all, perceptible, restoring very much the style of occlusion of the temporary teeth. These two cases have lost the twelfth-year molars.

FIG. 7.

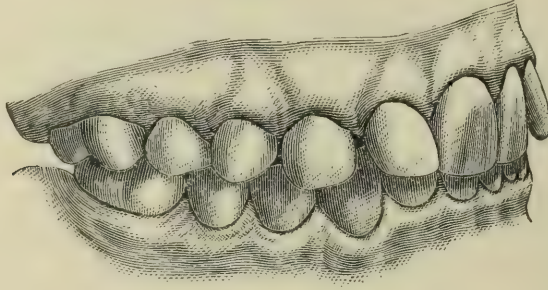
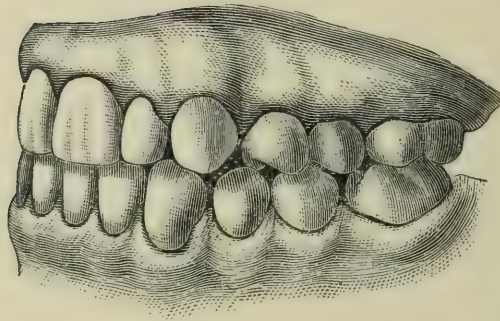


FIG. 8.



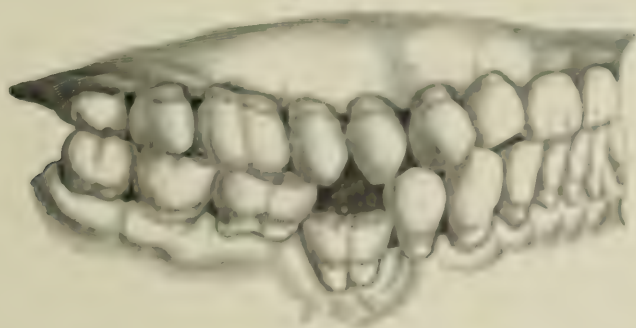
Another result that follows the loss of permanent teeth is generally a diminishing of the arch of the six front teeth, and a straightening, because of the shortening of the lines of the back teeth. The reason for this is apparent when we consider that the individual members of an arch are seeking to support each other.

The third effect, distinctly visible if permanent teeth are early extracted, is a diminution in the size of the arch or vault of the palate, the effect of which is to interfere very seriously with vocalization by diminishing the boundary lines in which the vocal organs must necessarily act, so that supreme vocalization, whether by actor, clergyman, singer, or lawyer, is in its greatest perfection impossible where the destructive hand of the extractor has been at work. Patti would never have been heard of if her sixth-year molars had been extracted at an early age. The straightening of the lines of dental arches and the diminution of the size of the arch frequently leaves so little room for the tongue that accurate

enunciation is rendered difficult if not impossible. This is one of the results that does not immediately supervene upon extraction, but comes later, and is therefore not as perceptible to the casual observer as some of the other results.

Again, a most important and highly deleterious result of extraction is that it shortens the bite,—that is, it causes the nose and chin to approximate more than would be normal had there been no extraction. Ten years ago, in discussing this subject with a professional friend, he presented for our inspection some models of the same mouth before and after the extraction of certain teeth, and asked me if the model after extraction did not show a lengthening of the bite considerably greater than that which existed before extraction. I was obliged to admit that there was lengthening, but the bite was not as long as it would normally have been had the extraction not been practised. One of our profession lately said, "The jaws are like scissors with something between. The least thing taken away allows the scissor blades to come nearer." This is very concisely put, but an ocular demonstration of the truth of my assertion—that with the development of the permanent teeth occurs also an increased development of the alveoli of both jaws and a lengthening or opening of the bite consequent upon the eruption of the permanent teeth—is very plainly shown in the diagram

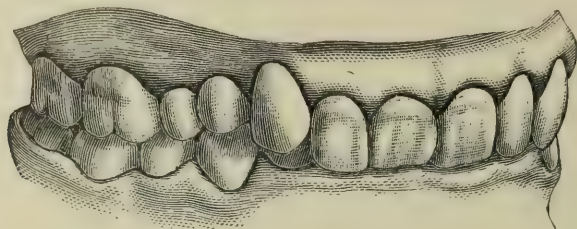
FIG. 9



and several models which I present herewith, showing certain deciduous teeth caught at their original level and remaining after the development and consequent lengthening of the permanent teeth. A patient came into my hands many years ago whose bite was so shortened by the extraction of the sixth-year molars that the lower incisors were not at all visible when the mouth was closed, but were striking the upper gums just back of the incisors to such an extent that the mouth was constantly sore and giving

pain. The molars and bicuspid were all wedged apart and approximal fillings that knuckled were put in, by this means preserving permanently, in a measure, the spaces that had been gained by wedging. This process lengthened the bite sufficiently to free

FIG. 10.



the gums from the contact of the lower incisors, and has remained an efficient remedy for twenty years. Occasionally after extraction of molar teeth the bite is so shortened that the lower incisors, striking behind and against the upper incisors, drive them forward and cause the upper incisors to project to such a degree that closure of the lips is difficult if not impossible. The only remedy for this condition of things is again to supply the missing teeth, or missing substance, thereby lengthening the bite and withdrawing the lower incisors from their contact with the upper ones. This is an operation that the more experienced men among us are sometimes called upon to perform.

Following upon this separation of certain teeth, where extraction has been practised, comes an undue crowding when the teeth touch at all. It is generally supposed, and, I think, is almost always said to the patient, that the extraction is done to make room. So far from making room, room is always diminished, and what room remains is crowded, not only by teeth touching too forcibly, but by their dropping inward in the straightened lines before spoken of towards the tongue, and impinging upon the room required by the tongue. If, a few years after extracting teeth, we were to take impressions of the same mouth, we should invariably find that room had been lost, not made.

Again, whenever the cutting or triturating ends of the teeth are not in contact, separation of certain teeth from each other is caused, leaving an exposure of the gums to the contact of hard food in the act of mastication. Another result incidental to these movements is the imperfect mastication of food owing to diminished surface and to the failure of the occluding surfaces of the

upper and lower grinding teeth to mesh, thereby rendering thorough mastication of the food impossible. We are sometimes called a nation of dyspeptics, and the fault is ascribed to bad cookery. Perhaps it might be as well to ascribe some of it to bad dentistry, which, instead of faithfully preserving all of nature's powers, so often impairs or destroys the masticating power, and so sacrifices the best interests of the patient for the sake of a fee that ought to put to confusion him who receives it.

The next result that is distinctly noticeable is the wearing down of the cusps in those cases where extraction is practised. I have seen greater wear of the cusps at twenty or twenty-five years of age under those circumstances than ought to be found at fifty or sixty.

All the results that I have mentioned are plainly enough shown to those of us who will take the trouble to make and study plaster models of our patients' mouths.

A further result of extraction is the greater liability to the deposit of tartar at points where the self-cleansing conditions no longer exist. This arises sometimes from the lower incisor teeth being caused to incline inward instead of outward, as they ought, in which case it is made difficult, if not impossible, to effectually guard against the deposit of tartar or of food. There is also greater liability to a profound deposit of tartar, even to the formation of calcic abscess, on the sides of teeth that are not quite in contact. All interference with the arches, whether by extracting or filing teeth, favors the deposit of tartar, not only by forming a nidus of tranquillity of the oral fluids, but by preventing that trituration, which by itself very often tends to cleanse the teeth from deposits of food or of tartar.

Another result of extraction is the withdrawal of the normal support of the teeth constituting the arch, with the consequent destruction of a portion of the support of the normal socket.

The final result that I will notice on this occasion is the rotation on their axes of teeth posterior to the one extracted, which always gives a bad occluding surface to the antagonizing tooth in the opposite jaw and a triangular space more or less pronounced for the deposit of food and tartar.

During the last sixteen years or thereabouts, so far as I glean from my records, I have only caused four firm teeth to be extracted. Three of these were impacted wisdom-teeth; the fourth was a lateral incisor standing so far out of line as to mar an otherwise

pleasant countenance. This incisor had resisted the efforts of several of our profession to coax it into place, and I considered myself justified in removing it, drawing the other incisors down to fill the vacancy.

I am sure that if my professional brethren will study the results of extraction, as I have been compelled to study them, from the failures that have resulted through extraction, their practices can scarcely be made as conservative as my own has been, and they will never extract unless the good to be gained will surely and greatly overbalance the injury that is sure to be done.

As an instance of what can be done in the way of regulating without extraction, I present diagrams of the teeth of a patient of my friend Dr. Baker, both before and after regulating, together with photographs of the patient before the operation, and several years after. The operations for regulating were all completed in a few weeks and without extracting any teeth, all of which is clearly shown by the illustrations. The success of this effort at regulating has, I think, converted Dr. Baker to the doctrine of regulating without extraction; as a rule, that has very few if any exceptions.

Abstracts and Translations.

ON THE RÔLE OF SYSTEMIC HYPERACIDITY, AND OF SULPHOCYANIDES IN THE SALIVA, IN CHEMICAL ABRASION OF THE TEETH.¹

BY M. MICHAELS.²

(Continued from page 256.)

ACCORDING to what has been already said concerning diatheses in general and their alterative effects upon the organism, it is evident that the cause of the lesion described must be sought in the saliva. But the salivary fluid is a complex, made up of the excretion of many glands,—parotid, submaxillary, sublingual, lingual,

¹ Paper read before the National Dental Congress of France, at the session at Nancy, August, 1898. Translated for The New York Institute of Stomatology by Drs. E. A. Bogue and C. O. Kimball, New York City.

² Honorary President of the National Dental Congress.



buccal, and labial. It is of the last, the labial glands, that we must say a few words, for the position of their excreting ducts seems to explain the peculiar localization of the erosion.

The labial mucous glands are situated between the muscular layer of the lip (the *articularis oris*) and the mucous membrane; they are very numerous, and describe a complete ring about the buccal orifice. More numerous upon the lateral portions of the lips than either at the commissures or in the middle, these glands lie in the thickness of the connective tissue under the mucous membrane, and are surrounded by fatty tissue. Each gland consists of several acini, and is provided with an excretory duct which widens at its lower extremity and opens upon the mucous surface in the vestibular cavity. Often the excretory duct receives other ducts from accessory glandules. To examine these glands the lip may be reversed and dried, and after a short interval a little drop of clear secretion gathers at each duct opening.

The mixed saliva produced by all the glands is a slightly alkaline fluid which contains a special ferment, *ptyalin*, in the proportion of seven parts per thousand.

Besides mucin, saliva contains chlorides of sodium and potassium in varying amounts, sulphates of sodium and potassium, earthy phosphates and carbonates, phosphate of iron, fatty matters, and derivatives of acid urates; these are constant elements. But in certain conditions we may find also urea, glucose, biliary pigment, lactic acid, and leucine, and these substances, except urea, are found only in pathological conditions.¹

I have no doubt that the functional activity of the glands dialyzes all these chemical elements out of the blood plasma. Dissolved in water they are easily recognized, if not by direct analysis, then, after dehydration, by the microscope, or by the polariscope with transmitted light. Certain crystals are volatile, or change in form, or lose their color on drying; but it is possible to fix them and cover them in time with Canada balsam.

Certain crystalline organic substances when in solution will crystallize out in varied forms, branched, stellate, coral-like, or

¹ The reaction of the saliva may at times be freely acid, at other times amphoteric. In patients with hyperacidity, if turmeric paper be employed, the acidity may always be detected on carefully drying the paper. This double reaction occurs also in urine. (*Traité d'analyse*, etc., Gossyp-Besarez.)

in amorphous and atypical shapes; and no treatment is necessary to produce these crystals except evaporation of the fluid, and they are often beautiful and characteristic. This fact appears important and interesting. Profound micro-polariscopic study¹ of the chemical composition of the saliva would enable us to recognize initial steps in a developing disease, and urinary analysis would confirm such results.

It is well known that crystalline elements of the urate series are at times present in the saliva of hyperacid patients, in whom dental effects of their condition have been unrecognized, as well as the fact that excess of such chemicals is peculiar to certain pathological conditions. Derivatives of the acid urates are found in the secretions of hyperacid patients (gouty and rheumatic), the series of the sulphocyanides of sodium, ammonium, and potassium, and the series of acid and basic oxalates.

Among patients with diminished acidity the creatin group is found, and thereby special effects are produced on dental caries; for the carious process is then extremely rapid, and I have two cases, occurring in young subjects, where the teeth have been lost in spite of all the efforts of specialists.

My investigations of saliva compel me to recognize other causes than micro-organisms for dental caries. The chemical influence of the saliva is undeniable, as can be proved by any physiologist or chemist who will respect my observations. The objections of certain authors, who deny that saliva contains acid enough to produce appreciable effects, seem to me to rest either upon experimental errors or upon lack of reflection. Various medicines introduced into the body reappear in the saliva; iodides, for instance, occur as alkaline iodides, bromides act similarly, mercury also,—in short, one may justly conclude that active glands absorb, secrete, and excrete other things than their normal products. No matter how feeble the dissolved chemical element may be, if it have affinity for a base, there is a reaction. These reactions may be more manifest, or less; that is merely a question of the proportions present and the length of contact.

The crystalline characters of a chemical element vary according

¹ The apparatus for microscopy with polarized light consists of two Nichols prisms; one, the polarizer, is placed beneath the stage of the microscope, and the other, the analyzer, is mounted on a hood that fits over the eye-piece. (Nachet.)

to the proportion of acid and of base present; as in the case of potassium oxalate, which in complete crystallization is regular but may also appear, not completely crystallized, in branching forms.

Synthetic urates of urea and uric acid are well developed and easily found when the diathesis (hyperacid) is well marked; they exist also in saliva, and if not found it is owing to imperfect testing or observation, and they give rise to a series of changes in the hard tissues.

Salts of soda, chlorate of ammonium, sodium chloride lactates, tartrates, oxalates, sulphocyanides, and glucose in unstable combination in blood plasma and excretory fluids, are all detected by simple drying, and may be studied by the microscope.

It is from my study of the crystalline elements in the saliva that I have arrived at the opinion that this fluid should be considered in its action upon the teeth, for it is the excess of the synthetic compounds of uric acid in the saliva which is the morbid element in certain pathological states.

Acidity of the saliva is a local expression of a constitutional condition, and by precipitating mucin tends to form deposits of *sordes* on the teeth; this causes a peculiar form of caries of the neck of the tooth, so characteristic that I have no doubt every practitioner recognizes it.

The rheumatic taint explains still other appearances of the oral tissues. Certain affections of the gums, gummy deposits in the jaw-bones, alveolo-dental abscess, degeneration of the ligaments, painless loss of the teeth, are all results which accompany the gummy constitution.

Among the rheumatic the characteristic changes are different; salivary acidity is dependent on the sulphocyanides of sodium and ammonium, while the local manifestations are alveolar neuralgia, nervous constriction of the palate, diminished saliva, the teeth "set on edge," pain in the maxillary joint, penetrating caries, and chemical erosion of the teeth.

The special forms of oral changes due to glucose in the saliva are so distinct that we need only mention the softened and bleeding gums, the stale or fetid breath, and the denuded teeth. Diabetes is a hyperacid diathesis, and the manifold local affections of patients suffering from the disease are constantly and almost always the accompaniment of other general alterations. I ought to mention, however, that I have observed loss of the teeth as the

initial stage of this disease. The fact is well known among medical men, and the analysis of the urine decides the diagnosis at once.

The changes observed in the teeth and the mucous membrane of the mouth are so clearly distinguished in different diatheses, that one must recognize a special salivary activity in each to explain the facts.

Fatty and uric acids, lactic and oxalic acids, acetone, and sulphocyanides are the acid matters which have a great affinity for the lime in the teeth. These acids occur in saliva in variable percentages, which explains the relatively long time needed to produce some of the effects.

The mistaken or unknown facts of vital chemistry, and the unrecognized relation of the saliva to each diathesis, result in the non-differentiation of these various acids and bases. Beaunis, in his treatise on Human Physiology, states that the presence of sulphocyanides in saliva is not constant, and that the conditions of their appearance are undetermined. He adds that they are thought to occur only in dental caries and in the mouths of smokers, although their formation has been clearly demonstrated in conditions other than these. According to him the mode of formation of sulphocyanides¹ in the body is unknown, but it may probably be explained by the presence of a molecule of cyanogen in the albuminous molecule. It is supposed, he declares, that sulphocyanides are only the result of disassimilation.

Gautrelet,² who is a biological chemist, states that the physiological excretion of sulphocyanic acid is considerable, and may be considered the chief regulator of the salivary glands, and hence of their digestive action upon starchy foods. The presence of sulphocyanides in the saliva may be detected by the addition of perchloride of iron.

But since derived uric acid combines with different bases,³ as

¹ Potassium sulphocyanide may be formed synthetically as follows: Neutral adenin is changed by nitric acid to hypoxanthin, and potassium hydrate with this gives potassium sulphocyanide, $C_5H_5(NH)_5 + H_2NO_3 = C_5H_4(NH)_2O + 2(NH) + H_2O$, and $C_5H_5(NH)_5 + KOH = 5C(NH)K + 6H_2O$.

² See Gautrelet, "Urines, dépôts, sediments, etc."

³ To detect faint traces of sulphocyanides in saliva or other organic liquids, which give no appreciable color with perchloride of iron, distil the

ammonium, potassium, and sodium, the exact combination in any pathological state should be determined in order to distinguish it from others.

Among patients with acid excess these salts are constant but of variable quantity, and perchloride of iron does not distinguish the base combined; hence mistaken conclusions are possible. It is necessary, therefore, to use other tests,—Nessler's, for instance,—to detect ammonium, platinum bichloride for potassium, etc.

In the numerous urine analyses made for me by Gautrolet, among hyperacid patients especially, to determine their characteristic dental changes, we have had opportunity to analyze also the saliva of some cases of chemical erosion of the teeth; and Gautrolet states that the sulphocyanide is an ammonium, not a potassium salt, as the physiologists claim.

According to my observations and analyses, sodium and ammonium sulphocyanides are easily detected (in the saliva of most hyperacid patients, and the microscope also discovers them); but there is never any chemical abrasion of the teeth.

I have determined that rheumatic patients have a characteristic form of caries, of a blackish tint, attacking the neck of the tooth. To clear up the question, M. Monfet, the chemist, has analysed for me the saliva of a case where there was chemical erosion of several teeth; and it was discovered that the sulphocyanide was a double salt of ammonium and potassium, and it is this latter element which, in my opinion, is the active cause of the peculiar destruction mentioned. The analysis of the urine demonstrated, further, a condition of rheumatism and neurasthenia. It contained abundant calcium oxalate, incompletely crystallized, the total acidity expressed as phosphoric acid was increased two hundred and sixty-one per cent., and the urea was only seventy-nine per cent.

In three other cases presenting chemical erosion the urine gave a similar analysis; there were abundant leucocytes and mucus, the calcium oxalate is constant, the acidity expressed as phosphoric acid is increased from one hundred and thirty to two hundred and ninety-five per cent.; the lower figure, acidity one hundred and

saliva with phosphoric acid, try the first drops which come over with filter paper dipped in perchloride of iron solution, to which has been added hydrochloric acid, and then dried; each drop of the distilled saliva gives a red stain. (Beaunis, *Phys. Hum.*, li. p. 27.)

thirty per cent., in a case of rheumatic migraine, was due to the fact that all the normal elements were reduced.

The salivary analysis in the same case gave 0.072 gramme alkaline sulphocyanides to the litre, or about five hundred per cent., and the salivary acidity, in phosphoric acid, was two hundred per cent. above normal. The average urinary acidity among the rheumatic varies from two hundred to three hundred per cent.

The characteristic features of the rheumatic diathesis, then, in my understanding of it, are diminished urine (from sixty to seventy-five per cent. of normal daily amount), and diminution of all normal urinary constituents together, and appearance in the saliva of uric acid derivatives, sulphocyanides, and oxalic acid, varying from two to seven times the normal.

Chemical abrasions of the teeth are very clearly circumscribed, and are due to constant contact of secretions from the labial glands; but the question remains as to what chemical agent dissolves the dental enamel and causes such destruction. In view of the numerous products which I have discovered in the saliva, already mentioned above, I have endeavored to reproduce chemical erosion experimentally.

The hypothetic action of alkaline sulphocyanides (of potassium and ammonium) is as follows: They dissolve the ossien¹ of the teeth, expose their mineral elements, and unite with them to form sulphocyanide of calcium and soluble phosphates of potassium and ammonium.

The following has been my method of experiment: Twelve cubic centimetres of saliva, freshly drawn, are filtered and acidulated with one drop of hydrochloric acid. The fluid is then divided into two portions. Of these, one is concentrated by gentle heat after a few drops of an alcoholic solution of platinum chloride are added, and at the end of four or five days octahedral crystals are developed, yellow in color, composed of platino-chlorate of ammonium and potassium. The other portion is evaporated to dryness in a platinum crucible and calcined at a dull red heat. The

¹ The organic principle which solidifies the prisms of enamel is keratine, a special chemical constituent of epithelial tissues, such as hair, nails, horn; and found also in non-epithelial membranes, such as gland capsules, the crystalline lens, sarcolemma, and neurilemma, and cell membranes of cartilage, bone, and connective tissue. The mode of formation is unknown. It is insoluble in alcohol and ether, swells up with acetic acid, and dissolves in caustic alkalies.

sialoin and ammoniacal salts are thus volatilized. A little distilled water, containing a few drops of alcoholic solution of platinum, is then added, and the mixture set aside. After four or five days, crystals slowly form, less abundant than in the other portion, entirely composed of potassium platino-chlorate, in straw-colored octahedral crystals; these are easily discovered by the microscope.

The patient whose saliva was thus investigated was my patient for several years, and in July, 1896, my attention was drawn to his case. On my request, Gautrelet, at Vichy, analyzed both his urine and saliva. The results were: Saliva: reaction neutral; contains ammonium sulphocyanide, 0.120 cubic centimetre per litre. Compare this with mixed saliva: 0.050 cubic centimetre per litre; and Jakowsky's figures: 0.060 cubic centimetre per litre. In other words, the saliva contained twice the normal amount of sulphocyanide, which in this case was only the ammonium salt, contrary to what I have found in normal saliva.

The urinary analysis by Gautrelet, of the same date, presents the special features of rheumatic arthritis; the urine was of high specific gravity, its fluorescence was increased, leucumaines abundant, and sulphocyanides in traces; abnormal element, calcium oxalate. The principal percentages were:

	PER CENT.	
Daily amount, 1200 cubic centimetres; normal 500		
this case, 1776 cubic centimetres		73
Acidity in phosphoric acid	2.22	201
Chlorine, as chlorides	7.40	120
Urea	84.97	79

Another analysis made in June gave about the same result, but the acidity was less, being one hundred and fifty-eight per cent.; calcium oxalate, crystalline and amorphous, very abundant.

The following case seems to deserve special consideration: Mrs. A., fifty years of age; superior incisors eroded and bevelled from top to bottom; chemical action, so intense that the dentine is bare over the whole surface. The lateral incisors have a layer of secondary dentine covering in the pulp-cavity. The canines are eroded in ridges, the affected part being fan-shaped and sensitive to heat and touch. The mucous membrane of the upper lip presents confluent salivary glands whose secretion bathes the whole surface of the teeth.

This case, remarkable for the extent of the trouble (Fig. 21), is also of interest because of the severe pain it caused. The sensi-

tiveness of the abraded surfaces was so acute that the patient was often obliged to keep to her bed. An anodyne treatment helped the condition until I decided to employ the potential cautery (chemical); the cure was immediate.

I have only the salivary analysis in this case. The reaction of the sulphocyanides was feeble, but, on the other hand, there was a strong ammoniacal reaction.

The hyperæsthesia varies much in different subjects of chemical erosion. It may be considerable in one case and absent in another, but when the abrasion results mechanically, from mastication, metallic supports for teeth, or too vigorous use of the tooth-brush, there are periods of increased pain at times. The old method of actual cautery with the red-hot iron was painful and rather frightful, and chemical caustics like silver nitrate and gold chloride are not very powerful, and discolor the teeth. I have employed antimony chloride¹ with advantage, but as the caustic power of this salt is extreme, the greatest care is required in its use. Such therapeutic use of it, however, is efficacious and free from inconvenience with certain precautions, and it does not discolor the teeth. The pain of its application lasts but a moment and is easily borne, but where there are several abrasions present I treat only three or four at a sitting. I apply the caustic by raising the lip and protecting it with a roll of cotton, drying the surface of the tooth, and with the dull end of a quill toothpick rubbing on a drop of the antimony chloride. I avoid touching the gums, and over the spot I lay a small piece of some protective and retain it several seconds. Lastly, the mouth is rinsed with soda solution, four grains of the bicarbonate to the litre of water. While this caustic action may be severely painful, such effects last only a minute or two at most, and where a slight sensitiveness persists for a few days the treatment should be repeated. But usually once is enough,

¹ Antimony chloride is a poisonous caustic which disorganizes the tissues, and under the name of butter of antimony has been used by physicians to cauterize wounds made by the bites of rabid or poisonous animals. It destroys at the point of contact, but only superficially, but I think it has a deeper effect in its tendency to coagulate and mummify the albumin of the fibrillary neurin. The cure is radical and without return. Experimentally one can put a little white of egg in a test-tube, and add a drop of chloride of antimony; with a hand lens the coagulum is discovered at the point of contact, and all about it is a zone of its influence, where the albumin has been rendered non-putrescible.

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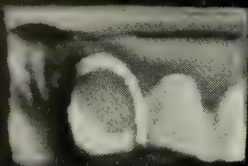


Fig. 2.

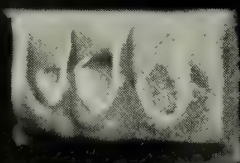
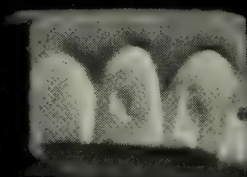


Fig. 1.



Fig. 3.

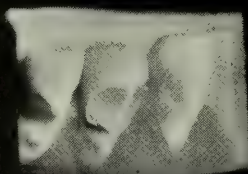


Fig. 4.

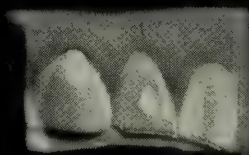
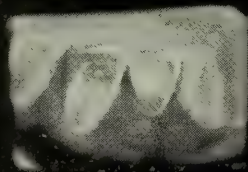
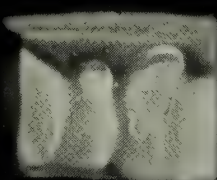


Fig. 5.

Types of chemical abrasion of the teeth.

in the manner described, which is also to be recommended in any case where the dentine is denuded.

The prophylaxis of chemical abrasion is twofold, local and general. The destruction of the teeth may be arrested by puncturing the labial glands with the Paquelin thermo-cautery. These glands are very small and not deep, reaching in only one and a half millimetres below the mucous surface, and very slight cauterization will destroy them. Moreover, these hyperacid patients should be put on general alkaline treatment. And when the derived uric alkaloids and the sulphocyanides become overpowered by the total alkalinity, the destructive action ceases.

As my hypothesis of a chemical action to explain these cases of dental erosion may be received with doubt, I made the following experimental research to confirm it, and repeated it two or three times:

In a litre of water I dissolved one gramme of potassium sulphocyanide, which is greater by far than the normal percentage of the salt in the saliva; but as chemical erosion in the mouth may take five to ten years, one is justified in using a stronger solution for the test. A capillary tube, drawn out to a fine point and curved like the letter V, was passed through a cork and one end dipped into the sulphocyanide solution. The other end carried a wire which held a natural tooth against its tip, and this capillary siphon, once started, kept the tooth surface constantly wet. The movement of the fluid was, of course, very slow, but from time to time a drop would fall from the tooth into a receptacle below, and at the end of some days the surface of the enamel presented erosions entirely comparable with those of several in the mouths of patients.

In all my cases, the hyperacid had ammonium sulphocyanide in the saliva, but no abrasions; while those whose teeth were thus affected presented in their saliva the sulphocyanide of potassium.

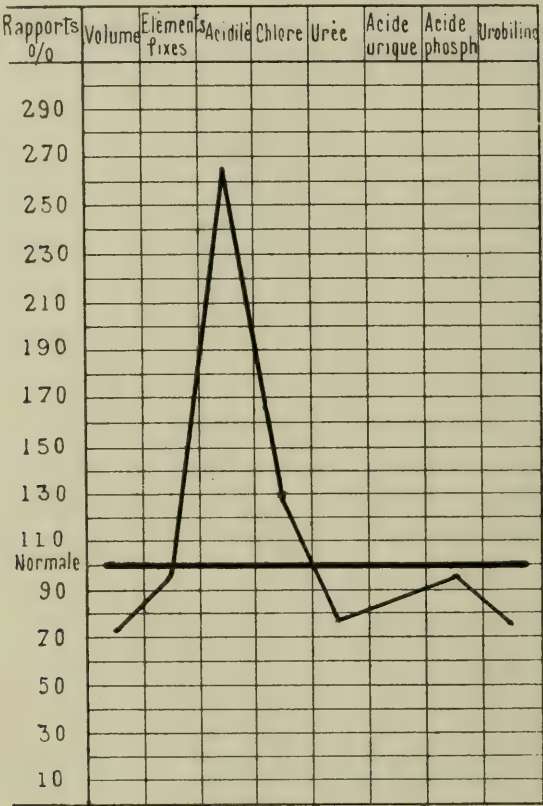
Therefore, by reason of my observations, experiments, and analyses, I feel that my hypothesis, which I have advanced to explain chemical dental erosion, a problem for so long even to distinguished physiologists, has been demonstrated a verity.

NOTE.

Case I., Fig. 1: M. L., aged forty-eight years; lower teeth, as well as upper, present chemical erosion. The lower incisors, expo-

cially the left lateral incisor, are more involved. It is remarkable that the process has destroyed the dentine under the enamel of the teeth of two millimetres. One tooth alone of the upper arch shows a small abrasion in the centre of its surface. Gautrelet's analysis of the saliva in this case shows: Reaction neutral; sulphocyanide (the ammonium salt), 0.120 gramme to the litre; normal mixed saliva, 0.050 gramme to the litre; Jakowsky's analysis, 0.060 gramme to the litre. The saliva thus contains twice the normal percentage of sulphocyanide, and it is not the potassium but the ammonium salt.

FIG. 1.

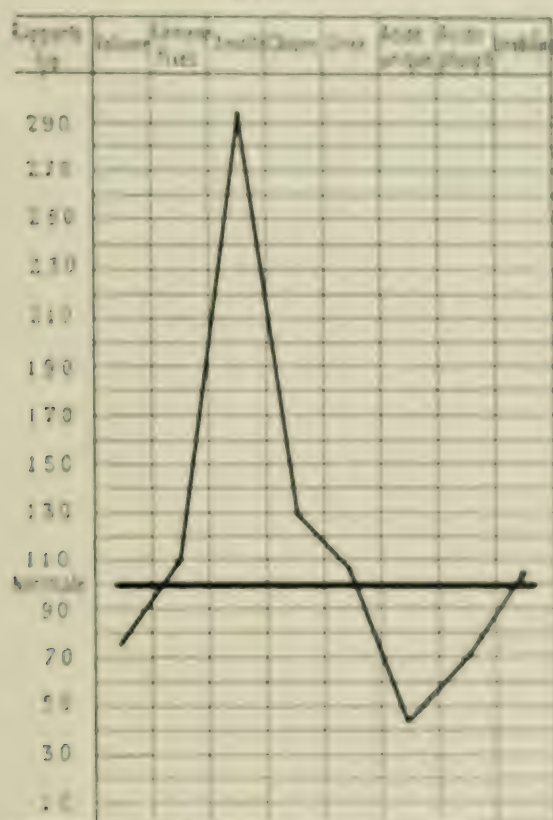


The urine presents increased acidity and chlorides; other normal elements decreased, calcium oxalate, skatol, and peptones. The total acidity expressed as phosphoric acid is 4.80 grammes per litre, or two hundred and sixty-one per cent., and the chlorine (as chlorides) is 7.94 grammes per litre, or one hundred and twenty-eight per cent.

Case II., Fig. 2: M. B. M., aged forty-two years; three of the upper teeth are abraded; the right canine is almost destroyed.

The surfaces involved are smooth and white, their edges sharp. The incisors and left canine present a loss of substance absolutely typical. Gautrelet's analysis of the saliva in this case gave 0.200 gramme sulphocyanide of ammonium per litre. The urinary analysis showed increased acidity; total acidity expressed in phosphoric acid, 5.08 grammes per litre, or two hundred and ninety-five per cent. Læncomaines abundant; traces of sulphocyanides and mucin; chlorides and urea abundant; phosphates diminished.

FIG. 2.



Case III., Fig. 3: Mrs. A., aged fifty years; superior incisors eroded and bevelled from top to bottom; pulp-cavity of lateral incisors opened; canines eroded in furrows; hyperæsthesia intense. Treated with antimony chloride. Salivary analysis not made, but tested in my laboratory, a notable increase of sulphocyanides was observed.

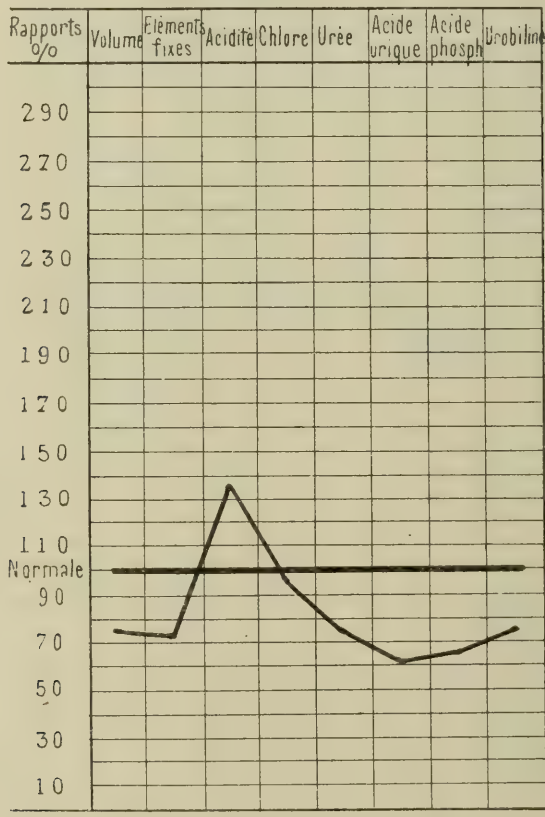
Case IV., Fig. 4: Baron J., aged forty-two years; left upper canine shows erosion with sharp edges. The first right premolar has an abraded surface and also a transverse groove near the gum, mechanically produced by the tooth-brush. The two erosions are

superposed and painless. The analysis of the saliva, made by Gautrelet, is as follows:

	Grammes per litre.
Total acidity in phosphoric acid	2.200
Normal	0.000
Alkaline sulphocyanides	0.072
Normal	0.015
Alkaline chlorides	4.530
Alkaline sulphates	0.460
Alkaline earthy phosphates	0.880
Peptone	trace.
Albumin	0.340
Leucomaines	abundant.

Microscopical examination revealed abundant epithelial cells, cell nuclei, leucocytes, and bacteria. Urinary analysis revealed a decided increase in the acidity. Expressed as phosphoric acid it

FIG. 3.



was 2.27 grammes per litre, or one hundred and thirty-two per cent.; chlorine, urea, and phosphates were diminished.

Case V., Fig. 5: Mrs. B., aged forty years; characteristic be-

ginning chemical erosion; rheumatic diathesis. Left upper incisors and right lower incisors involved. The saliva contains traces of ammonium sulphocyanide. No urinary analysis. Case incomplete.

Reports of Society Proceedings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on Tuesday evening, February 6, 1900, at the office of Dr. K. A. Bogue, No. 63 West Forty-eighth Street, New York, the President, Dr. E. A. Bogue, in the chair.

The minutes of the previous meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. W. St. George Elliott.—I would like to ask if any of the members of the Institute have any knowledge of the use of the ethylate of sodium. Some years ago my attention was called to it, and I have used it ever since. It is very corrosive, and injures the stoppers of the bottles so that it is often impossible to get them out. It is useful in cases where it is necessary to remove a portion of gum lying in a cavity: a piece of cotton saturated with the ethylate of sodium and applied to the gum removes it effectually in a gelatinous mass, and generally without pain. It is also a very excellent medicament for cleansing root-canals.

Dr. Geo. S. Allan.—Where is it obtained?

Dr. Elliott.—It was originally imported from England, but now, in the form of a powder, it can be obtained from any druggist.

Dr. J. Morgan Howe.—Is it preferable to caustic potash?

Dr. Elliott.—I have never used it in the same place. I rather fancy it has not at all the same action. When I was practicing in London, a young lady came into my office with a small tumor on the upper lip, just over the left lateral incisor, and which was just about the size of a pea. I did not investigate it microscopically, but asked her to allow me to remove it with cautery. She objected, and consulted a surgeon. He pronounced it a very serious

growth, and stated that she would have to undergo a painful operation, attended with the loss of one or more teeth and a portion of the process, and that even then there was a liability of recurrence. The next time she called at my office I again asked to be allowed to experiment with it. She consented, and I applied the ethylate of sodium. The tumor disappeared and has never returned.

The President.—If there is nothing further to be said under this head, we will proceed to the essayists of the evening. I am pleased to announce that we have with us this evening Dr. Horatio C. Meriam, of Salem, Mass., who will describe to us a new suspension crown. I take pleasure in introducing Dr. Meriam.

(For Dr. Meriam's paper, see page 293.)

DISCUSSION.

Dr. F. Milton Smith.—I would like to ask what gutta-percha Dr. Meriam finds to be most useful for his work; also the kind of gold he uses, and what the gauge is?

Dr. Meriam.—I find that the most useful form of gutta-percha is a combination of oxide of zinc, six parts, and ordinary Sumatra hard white gutta-percha, one part, softening this as I use it with any of the essential oils. I frequently put a drop of oil of sassafras in a well in my porcelain slab, and dip my gutta-percha into it before introducing. I prefer gutta-percha for this work because the piece can be so easily removed. The gold I use is eighteen parts of pure gold, five parts of silver and one part of copper. This I have a refiner roll out for me to about a 30 gauge, and when more strength is required I use two or more thicknesses.

Dr. Smith.—I would like to ask Dr. Meriam if he makes these open face bands to fit as tightly as he can to the tooth which they are to cover, or does he leave a space for the gutta-percha?

Dr. Meriam.—That depends upon the condition. For an extension crown it is necessary for the band to fit tightly, but in making a bridge with a suspension crown this is not so important, and the band may be a little large and filled with gutta-percha, so that the appliance can be easily removed.

The President.—Dr. Frederic L. Bogue is unable to be with us to-night. He has, however, sent his paper, which Dr. Davenport has kindly consented to read.

Dr. S. E. Davenport.—Dr. Frederic L. Bogue has prepared the little paper which I have the pleasure of presenting to you. I

am sorry to say that he has been ill for the past two or three days, and regrets very much not being able to be with us to-night. The subject of his paper is "A Modified Wire Clasp."

A MODIFIED WIRE CLASP.

BY DR. FREDERIC L. BOGUE.

MR. PRESIDENT AND GENTLEMEN,—Before presenting the little modification, which at best would only be applicable to a very limited number of cases, I think it would not be amiss to call attention to the ordinary wire clasp, which, so far as I can learn, is not in general use.

I believe our fellow member Professor J. P. Michaels, of Paris, was the first to suggest its use abroad. At about the same time, Dr. W. S. Elliott, of Sag Harbor, patented and advertised it in this country. Although working independently, the forms of clasp devised are almost identical. The gauge of the wire used in these clasps is from nineteen to twenty-one, depending upon the relative degree of rigidity or elasticity required. The wire furnished by Aderer Bros. is very satisfactory, inasmuch as it does not lose its elasticity when annealed, as most of the other makes do.

Some of the advantages of these clasps are: lightness combined with strength; great elasticity; are easily bent to fit teeth of any shape, especially convex teeth, the lower wire fitting under the tuberosity, the upper wire above it; minimum contact with the surface of the tooth, which is an advantage because a tooth bearing a clasp is injured not only by mechanical abrasion, but by the chemical decomposition of the *débris* held in contact with the tooth by the clasp.

The modification I wish to present this evening was designed for a case in which the back tooth tipped forward, forming a space which was largest at the gum margin. The idea was to make a fixture easily inserted and removed, and yet one that would fit the teeth when in position.

The clasp for the back tooth was made and attached to the plate, as though no undercut existed. The standard for the forward clasp was soldered the thickness of the clasp wire back of the front edge of the plate. This is done in order that the plate

might extend as far forward as possible without having the clasp wire interfere. The upper end of the standard was bent forward almost at a right angle, in such a way that when the upper wire was soldered to the front of the bent end of the standard, the wire would be in contact with the tooth. The object of bending the standard in that way was to prevent the fixture from being driven forward during the act of mastication. The forward clasp, which was shaped like a hairpin, was fitted to the tooth. The upper wire was soldered to the standard; the lower wire, being left free and fitting the neck of the tooth, was brought far enough around to be accessible from the front. When it is desired to remove the fixture, the lower wire is pressed back against the standard and the plate lifted up from the front end.

Dr. F. J. McLaren.—I have used these clasps very extensively, and in certain cases find them almost invaluable. The fact that a firm attachment to the tooth can be combined with a great amount of resiliency is in itself a marked advantage. They are very useful in cases where there is a single tooth, as a molar or a canine, remaining, and in those where it is desirable to combine retention by clasp with suction. We all know how the ordinary clasp will interfere with the suction of a plate, but with the wire clasp there is such mobility that this interference is overcome. There is one slight objection to these clasps, and that is the fact that the ends cannot be cut off. I overcome this difficulty by soldering pieces of gold on the ends instead of making an all-wire clasp.

Dr. J. Bond Littig.—Are these simply wire loops?

Dr. McLaren.—They are double loops attached at one point. They were at first only made with one loop. Dr. Elliott, who patented them, made them in some twelve or fifteen patterns. I use the straight clasp wire, beginning at one end and contouring it along until I have it the desired shape, then bringing it back in the same way to where I started.

Dr. L. C. Leroy.—I find these wire clasps of the greatest advantage in attaching such appliances as removable bridges, holding the appliance firm and giving least amount of contact with the tooth. The only teeth to which they cannot be attached are the canines. They are especially adapted to bell-shaped teeth.

The President.—I am pleased to say, in reply to Dr. Leroy, that I put in a gold plate last November for a gentleman eighty-six years old. Only the six front teeth remained on the upper

jaw. I clasped the canines, using the wire clasp, and the plate was very successful.

Dr. Leroy.—The impression I meant to convey was that the canines were ill adapted for these clasps as compared with the other teeth. Of course, it is not impossible to clasp them in this manner.

Dr. Charles A. Meeker.—I would like to say that when Dr. Elliott first introduced these clasps I bought some, and have used all varieties ever since, more especially in rubber work. I use for this work German silver wire, which I obtain from Patterson Brothers, Park Row, New York. I find the German silver wire adheres more firmly to the rubber and is more easily contoured to the tooth, altogether giving better results than the gold wire.

The President.—In Dr. Bogus's modification I would call attention to the free end of the wire. This end is either melted down into the shape of a knob, or else a drop of solder is placed at the end of the wire and melted, leaving the free end of the wire with a small smooth knob.

Dr. J. F. P. Hodgson.—I would like to ask if any one can use these clasps, or if there is a patent on them.

The President.—I wrote to Dr. Elliott when the patent was first published, telling him that I had then been using these clasps for a number of years, and warning him that there was no use trying to uphold a patent if he had one. I can thank Dr. Michalek, of Paris, for the idea, as he gave it to me some years before Dr. Elliott brought it out.

Dr. Elliott.—It has been said of a certain warm country, that it is paved with good intentions. It was my intention to make several drawings of the cases I am to bring before you to-night, but unfortunately I was prevented from doing so. The three cases came to me in the one week.

A gentleman had broken his central incisor by an accident. I found the parts very much inflamed. I gave him the choice of a bridge, a plate, or an implanted tooth. He chose the latter. With difficulty I found a tooth of the proper shape, and after cutting it off, fitted to the root a backed porcelain crown of the proper shade and shape. The only thing new was in the way I made the splint, which was swaged from silver, covering the cutting edges of the teeth; but instead of making holes for the ligatures in the splint, it was split at intervals corresponding with the spaces of the teeth.

After being properly fitted, it was thickly covered with oxyphosphate and placed in position. It was very readily applied, and answered the purpose very well indeed.

Another case was that of an upper left bicuspid, which I had prepared for a Logan crown by cementing a cylinder into the root. The operation seemed successful, but inside of four days the patient came back with the cylinder out, and I then found the root was split. After again applying the cylinder, I made a hoop of platinized gold which fitted very closely, and this I drove on with a hammer, and the crown was again inserted. Since then I have had no further trouble.

Another case was that of erosion involving the labial surfaces of the two upper centrals. It was the worst case of erosion that I have ever seen. There was, of course, great difficulty in obtaining proper anchorage. I did this to a certain extent by cutting shallow grooves all about the edges of the teeth, and then, by using the ordinary process of a platinum matrix, I baked a porcelain facing, which on being placed in position very much improved the condition.

The last case which I wish to mention was that of a split molar. It was split nearly in the centre. I drilled a hole through it and passed through a German silver bar, on one end of which was a head, which I countersunk into the tooth. On the other end was a thread, to which a nut was fitted. This was put in with cement, and after it had been in position for a few days the nut was ground off, the tooth being retained by the cement. Generally a shell crown is preferable, however.

Dr. Hodgson.—I am reminded of a very mortifying experience of my own in this direction fully twenty-five years ago. I had bolted together with infinite care and pains the split shells of a large molar, and built into it a strong filling, enclosing the bolt. In a few days the whole sides had split away in the other direction. It became my decided opinion that a tooth which could so split, being generally an old pulpless one, does not often possess sufficient toughness of structure to admit of its large sides being held together reliably by a tiny bolt-head. I always thereafter employed a narrow gold or platinum band, according to whether gold or amalgam were to be used for filling, perfectly fitted and set with oxychloride or gutta-percha and having horizontal arms reaching from it into the large cavity to be enclosed in the after filling.

This was in the old days before the gold crown. I should not feel it to be justifiable to use this method at present, when we are able to get almost perfect adjustment and lasting strength for these back teeth with properly adapted gold crowns.

The President.—I should like to ask Dr. Hodgson whether he considers the friability of the tooth of which he speaks due in any degree to the loss of the pulp.

Dr. Hodgson.—Possibly not so entirely on the fact that the pulp was dead as upon the additional fact that this death of the pulp has been followed by a decay of the dentine extending nearly to the enamel, which, as we all know, is a friable combination very easily fractured.

Dr. Meriam.—A tooth very frequently met with in this split condition is the first bicuspid, and it is sometimes a very difficult one to deal with. One of this kind I treated by means of a strong platinum-iridium staple set in the roots with phosphate cement. The tooth gave service for many years. A split molar was also treated in this manner by placing pins in the canals. The tooth was crowned and has lasted for fifteen years.

Dr. Charles O. Kimball.—I have nothing particularly new to offer, but there are one or two cases which I should like to mention. The first case is that of an upper second molar which had decayed and had been patched and filled so many times that it had finally broken off and the three roots stood apart. They were all in a loose and very bad condition. I first sterilized them and got them in good condition. I then made of platinum wire a three-pointed tack, each point corresponding to a canal. This was set into the roots with cement, and around this was built oxyphosphate cement.

It has been in now for six years and is still doing good service. The roots, which were so exceedingly loose, have become firm, and it has been a useful tooth ever since. I think now, were I to do the same operation, I should use amalgam instead of the cement; the result, however, has been very satisfactory. The other illustrates the advantage of sticking to a case. Four years ago a lady about fifty years of age had up to that time been wearing an artificial upper central incisor since she was a girl of seventeen. It was a pivot tooth set on a firm root. The cavity of the root a good many years ago had become enlarged, and I had had a tube set in it. While she was abroad she noticed that this root was offensive. On her return I found that the tooth had split, going a little to

one side, and as the pivot tooth had been set with gutta-percha, there was quite a separation, over one-thirty-second of an inch. The split apparently, so far as I could judge, went up in an oblique direction, and the tube which was set in the root was still firm in the larger portion. I drew the pieces together with silk, taking two or three days to do it, and proceeding very gently, as it was very sensitive. I could not, however, approximate them entirely. The best I could do was to get them together at the lower end, and after trying for several days I had to content myself with getting the band around the end of the root. There was a great deal of irritation and discharge. I saw a friend of mine, who advised implantation, but I concluded to wait a little while before doing this. I gradually succeeded in sterilizing the tooth, and the discharge finally ceased. In making the crown for this tooth I had it so made that a little ridge of gum covered the band completely. My friend, who wanted to implant a tooth, said he thought it would not last over two years. It has gone for over three years, and the root is in better shape now than it was in the beginning.

Dr. Howe.—I have used a method of treating molar roots that have become separated, which has served me well for a number of years. After the root-canals have been treated and any existing abscess cured, in each root a strong stiff pin is set in cement, letting it stand up above the end of the root. These are then drawn together by means of a contractile thread, such as the grass-line. After which they are held in position by binding wire around the pins. Leaving this wire in position, I place a matrix around the roots at the gum margin and fill with amalgam, leaving the matrix on till the amalgam sets. A gold cap may then be adapted to make more perfect contour if desired. In that way I have restored very badly broken down molars, and in many cases the results have been most satisfactory. The appearance of some such amalgam crowns, and of amalgam fillings too, after ten to twenty years of service, I consider a refutation of the claims of amalgam-makers that there is no good amalgam but that made after the most modern ideas.

Dr. Elliott.—Regarding that last remark, I wish to state that recently I have been making a good many experiments with amalgams, particularly with the "Fellowship" and "Twentieth Century," and I find them no better than the old amalgams. I recall a case of a second lower molar, the roots of which had separated and were in an unhealthy condition. After sterilizing and getting

in good condition, without attempting to draw the two together I put a crown on the root resting on the gum. The crown is now in perfect condition and has been in position for eighteen years.

Dr. B. C. Nash.—I recall one case which caused me a great deal of concern, as it occurred early in my practice,—that of a lower molar with a cavity on the buccal surface. The pulp was dead and the canals had been skilfully approached through this buccal opening. I carried on the treatment, filled the roots, and finally inserted in the buccal cavity a gold filling. Two days afterwards the patient returned with the filling out. On examination I found that the tooth had split directly across. I fitted a gold band around the tooth and filled it with amalgam. I have never seen the patient since, and received no pay for the operation. This experience taught me not to experiment with split teeth.

Dr. Allan.—I have a tooth here which I obtained years ago at the old Johnson depot. It is a split molar, and has a peculiar history. The man in charge related the history, offering the tooth for sale at five dollars. It seems that this tooth had caused the patient severe pain for several weeks, but the dentist could find absolutely nothing the matter with it. One day the fellow came in and said he was cured; that he was all right now. He said "the d—d thing exploded." How this happened I do not know, but apparently, according to this history, relief was obtained after the tooth split and the pressure was gotten rid of.

Dr. Meriam.—I have had a similar case of great pressure in a tooth. The case was a central incisor, which I was drilling into. On withdrawing the drill after passing it into the pulp chamber, it was followed by the entire contents of the canal.

The President.—One of the gentlemen in the course of the discussion spoke of wishing to implant a tooth and not finding one of the proper color. I had a similar experience two or three years ago, and finally was obliged to implant one which was not the exact shade. The shade of this tooth has changed, and last year when I saw it the color was exactly right. I should like to know of the gentlemen who have had experience in implanting teeth, if this is the usual case.

Dr. Hodgson.—I wish to call attention to the usefulness of touching the warmed gutta-percha on its way to the cavity with the oil of cajeput, on account of the increased stickiness of the gutta-percha so treated, such a filling actually cementing itself to the

walls of the cavity. It can even be applied wet, and so is of real value in treating a patient ill in bed, etc. The experiment has been performed of sticking a piece of gutta-percha so softened to the inside of a tumbler filled with water, and after cooling it can only be removed with difficulty. It is useful in applying temporary stoppings where there is little or no retention. Also in those cavities which extend clear around a tooth and are so difficult to fill. In this latter case, however, and, indeed, wherever I need more lasting filling along with the cemented quality, I have devised a method which is far superior to the foregoing, in that the gutta-percha is not injured in the least. It is to flood the dried cavity with the oil of cajeput and absorb out the excess, leaving the walls damp; then packing into it the warmed gutta-percha, holding the filling if necessary with an instrument held in the left hand until the packing is completed.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
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AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, December 6, 1899, at six o'clock.

President Pond.—It is very evident we have a subject of unusual interest to-night. Whether it is due to the unfortunate case that we have had in the city, and the discussion induced by the fact that it was reported in the public prints, it has attracted a great deal of attention. I have no doubt that this evening we shall learn much more about it than we have previously known. I have to announce the report by Professor Thomas Fillebrown of "A Fatal Case of Hæmophilia."

(For Dr. Fillebrown's paper, see page 302.)

President Pond.—We are fortunate in having with us to-night another gentleman who is interested in this case, and had a part in the treatment. I have the pleasure of introducing Dr. Charles A. Porter, who will give us a paper on the subject of "Hæmophilia."

(For Dr. Porter's paper, see page 295.)

DISCUSSION.

President Pond.—This is a very interesting and instructive paper. We are remarkably fortunate in having present so many gentlemen who took part in the treatment of this case. It gives me great pleasure to introduce Dr. G. W. W. Brewster, who will open the discussion.

Dr. G. W. W. Brewster.—Gentlemen, I think we all feel indebted to Dr. Fillebrown for reporting this fatal case of hæmophilia. If one looks over the literature of the subject, he is impressed by the number of successful cases reported in the various journals, and of the different methods of stopping bleeding in hæmophilia. In the light of Dr. Porter's paper, it seems to me probable that many of these cases were not true hæmophilia.

In reporting a fatal case like this one of Dr. Fillebrown's, a surgeon or a dentist shows a great deal of courage. As a rule, we do not like to report our fatal cases, but it is from the report of just such a case as this that we obtain, perhaps, some of our most useful knowledge.

I remember very well a case that Dr. Richardson operated on for tumor of the kidney, in which the patient gave a history of hæmophilia,—i.e., of excessive bleeding,—from a cut at some past time during her life. I should not say a history of hæmophilia, but a history of bleeding, for I do not believe it was hæmophilia. The operation was justified by the severity of the case, and the tumor of the kidney was removed. The patient made a perfectly good recovery. If this had been hæmophilia, there would have been a complication of hemorrhage.

I cannot speak from any extended personal experience of this disease, because Dr. Fillebrown's case was the first one I had ever seen. In dealing with hemorrhage in surgery, our methods are almost always successful—I should say, always successful—in connection with operations. If large wounds are left, and the oozing cannot be controlled by the pressure of forceps and ligating the vessels, a firm pressure of gauze almost invariably controls the hemorrhage. The advantage of gauze over all other material for pressure lies in the fact that a firm pad of gauze over a bleeding surface affords pressure on the vessels, while it allows the blood to escape into the meshes, and there is no chance for a layer of clot to form between the dressing and the bleeding surface. This, I think, is

the reason that absorbent gauze is better to use for hemorrhage than absorbent cotton.

Dr. Porter has covered very fully the medical aspects of the subject, and I have nothing further to add. From a surgical point of view I think it might be interesting to show you the method and the apparatus necessary for salt infusion. In the last part of his paper he stated that salt infusion—*i.e.*, the introduction of a salt solution into the vessels—was probably of no use. And, theoretically, it seems as though that were perfectly true, because if we inject a quart of salt solution, it would probably run out as freely as the blood. It seems to me, however, that there is a time when salt infusion might be of service in these cases. Suppose that all methods have failed, and we are waiting for the time to come when the patient has bled all that he can bleed, hoping that the hemorrhage will cease just before he stops breathing: salt infusion at that critical time might give enough renewed strength to tide him over, and with renewed attempts to stop the bleeding the fatal outcome might be warded off.

There are two methods of introducing salt solution into the organism in cases of excessive loss of blood. One is by infusion under the skin, into the subcutaneous tissue. The method is very simple, and does not rank as an operation. It requires simply a fountain syringe, a large-sized hypodermic needle, and a sterilized salt solution, which is boiled water with six-tenths of one per cent. of salt in it. The needle is put under the loose skin of the flanks or breast, and the fountain syringe raised high enough to allow the water to run slowly into the subcutaneous spaces. Between a pint and a quart of water can be introduced in that way, supplying fluid for the emptied vessels. For immediate and quick effect, the infusion into the veins is the most satisfactory method. In cases of great loss of blood, when the patient's pulse has become thready and uncountable at the wrist, a pint or more of salt solution injected into the vein will revive him.

I have brought with me the apparatus necessary for the salt infusion. The operation is very simple, and can be performed, I am sure, by any man who is as dexterous with his hands as a dentist. This particular kind of a canula, which has a blunt point, is necessary, because if it has a sharp point it may puncture the other side when it is put into the vein. It has this rubber tube with a funnel at the end. This can be boiled before operating. The place

of infusion is usually a vein of the arm, one of the veins at the bend of the elbow, the one that stands out the most. A bandage is placed around the arm just above the elbow. This fills the veins and shows the most prominent one at the bend. An incision is made through the skin, and the vein dissected from the surrounding tissues. A space of at least half an inch of the vein should be exposed. Then a piece of silk or any form of ligature is placed around the upper part of the vein, and another piece of silk below. The bandage is removed from above, and the ligature below is drawn up. This holds the vein up out of the wound, so that a small cut can be made in it between the ligatures. The apparatus in the mean time is filled with the salt solution and the water allowed to run out of the end of the canula to remove all air. With the salt solution dribbling out of the end of the canula, the incision is easily found and the point of the canula is slipped into the vein. The ligature is tied around the canula, and the salt solution passes into the circulation. The usual amount given at one time is between a pint and a quart, and the temperature is about 100° F. The hotter the solution, the more quickly it will affect the circulation. The effect is instantaneous on the pulse.

I am sure there are many gentlemen here who have had cases of hamophilia, and can add their experiences to this discussion. I thank this society for the invitation to be present this evening.

Dr. M. C. Smith.—There is one feature that has not been touched upon, and that is septicæmia. These patients, after they have bled for eight or ten days, are very susceptible to septic influences; and I have seen more uneasiness, or more bad symptoms, from what you would be more inclined to call septic symptoms than from loss of blood.

There are a couple of cases that I would like to report this evening. One was not a patient of mine, but I was consulted in regard to it. Mrs. A. was taken to a hospital with a slight laceration of the cervix. Dr. P., a very careful surgeon, operated. After he had stitched the parts together he found there was still an excessive hemorrhage. The more stitches he put in, the worse the hemorrhage became, and he had to resort to a very firm vaginal tampon to control that hemorrhage. It caused a deal of trouble. The patient finally rallied and picked up. Soon after leaving the hospital she went to one of our fellow-practitioners in the city and had some teeth out. She bled for a number of days, until she

was in rather a septic condition. She had also an eruption, especially on the thighs. A doctor in Maine told her the dentist had inoculated her with syphilis. Her husband came back to Lynn very much wrought up over the subject, and went about consulting a number of physicians and lawyers as to what the legal aspects of the case might be. He went to Dr. P., who told him that he could see no indication of syphilitic contamination. The husband vowed that his doctor in Maine claimed it was syphilis, and he was going to sue that dentist and have satisfaction. Dr. P. said to him, "Young man, you had better go a little slow; it will bother you considerably to prove that eruption is syphilitic, and then some of your neighbors may accuse you of giving the syphilis to your wife yourself." I believe that ended the legal aspect of that case.

I now wish to report on a patient of mine, a little girl. From birth up to somewhere about three years of age the parents had little hope of raising her. This same Dr. P. was called in, and he kept her along for a number of years, and the "sheet anchor" of his treatment was ergot; that was the only thing that seemed, in his opinion, to do any good. She came to me probably about the sixth or seventh year, to have some temporary teeth extracted. The story, as told by the mother, was that she would bleed for days at a time from the nose, also from the ears and eyes. When a cold sore on the lip was about ready to scale off, a little crack would start in and bleed sometimes a week or ten days at a time. I extracted teeth several times, and I think, without any exception, she bled for ten days constantly. In that case I did not dare to use a compress. I found that the more pressure I used, the worse it was, and the blood would ooze out right at the edge of the pressure. If I exerted pressure over the bleeding portion, it was sure to start up a worse hemorrhage than that which I was trying to control. In that case I gave up pressure entirely. The best results I had were from light applications of the solution of persulphate of iron, applied in rather diluted strength, but we had to depend principally upon ergot; and in her case this worked very nicely indeed. The mother always kept it in the house, and whenever the girl had these spells, she commenced giving her the ergot.

Several years after, I extracted all of her four first molars, and each time we got the regular ten or twelve days' hemorrhage. She kept on in this manner until she was about thirteen years of age, when she had her first menstruation, and came very near dying

at that time. Dr. P. was called in, and found her in a very critical condition. He looked her over quite carefully, and the conclusion he came to was, that it was useless to use a vaginal tampon. He said if he did, the pressure he would have to use to get it in would enough to do any good would in all probability have ruptured some of the hymeneal arteries, and he was afraid he would get a worse arterial hemorrhage than from the menstrual bleeding. His treatment was complete rest, lying on the back, head down. After some days she rallied from that. She picked up wonderfully, and looked as healthy, bright, and strong as any young girl I have seen for some time. After the first menstruation I had her as a patient, for some filling. She was in the office a number of times, and I remarked how well she looked. At her second menstruation she died from loss of blood. I do not think in that case there were any septic symptoms whatever, but that she died from exhaustion due to loss of blood.

Dr. Eames.—Gentlemen, in speaking further upon this question, it may be mentioned that it is possible to induce a condition similar to hæmophilia in previously healthy persons by the privation of fresh air and sunshine. I once had a patient who was living in this unhygienic condition, and the extraction of a tooth was followed by hemorrhage lasting about a week, although the usual treatment was employed. One year from that time a similar tooth on the other side of the mouth was removed, but on this occasion the fluid extract of ergot was administered for one week previous to the operation, and nothing more than the normal amount of hemorrhage followed.

As to the local styptic, I think a good many would disagree with the use of persulphate of iron on account of the irritation which might ensue. In any case of protracted hemorrhage it would hold quite as good as in a case of hæmophilia. I do think that the manner of using the local styptic is important. Tannic acid should be preferred to the iron, as it appears to form a stronger and firmer clot. A very small piece of cotton saturated with tannic acid and glycerin should be carried to the extreme bottom of the abscess, followed by larger pieces.

I have no personal experience with the use of the galvanic current for the purpose of stimulating contraction of the arteries, but it has been found useful.

It seems important to take note of the action of the heart in

cases of severe hemorrhage, for there is, necessarily, extreme action of the heart on account of the nervous excitement and loss of blood. For this condition I would suggest the use of opium; and the acetate of lead to promote coagulability of the blood.

Dr. Daly.—It has been my unfortunate experience to have to extract many teeth in the last few years, and I cannot but note that in the last ten weeks I have had more hemorrhagic cases than in any ten years all put together. I have the record of eleven that have taken place in the last ten weeks, all of more or less severity; nothing like intense hæmophilia, however, but they were very annoying bleeding cases. I have always used for many years ammonio-ferric alum, and have had fair results. I would like to ask the gentlemen if they have noticed any cases of bleeding lately, more than at any other time?

Dr. G. T. Baker.—The very day that I received the card of the Academy announcing the subject for this evening,—“Hæmophilia,”—a young man presented himself and informed me that he was a bleeder. It was the first time I had ever had such a case, and so I went to work with unusual care. There was one tooth that had an exposed pulp, and I made an application to destroy the pulp; and it being an approximal cavity, I allowed the dressing to rest on the gum slightly and to remain there several days. When the patient came back I noticed a slight oozing of blood, not only from where the cotton touched the gum, but for quite a little distance beyond, and, in fact, he told me it had been bleeding. I removed the dressing and did nothing, and observed next time that the case was all right.

There is one remedy for secondary hemorrhage which I heard of a great many years ago, and which I have not heard spoken of in a dental meeting since. I have had occasion to use it several times, and it has always worked very satisfactorily. I used it in one case where a young man had bled for several days, and the hemorrhage stopped at once. It consists of picric acid, and it may be familiar to many here. It is made by taking a drop of creosote or carbolic acid and a drop of nitric acid, put side by side on the top of an inverted glass or other convenient article. Now take a pledget of cotton and dip it first in one and then in the other, and after waiting a moment, pack securely in the alveolus. The union of the creosote, nitric acid, and cotton forms a violent explosive compound, and must be handled with care. I think Dr. Daly is

familiar with this method. Dr. I. J. Wetherbee first taught it at the Boston Dental College, and I think the method is original with him; in fact, I am sure it is—he told me so.

Dr. Joslin.—There are two points that interested me especially: one was that hæmophilia was extremely rare in women; in fact, being twelve times as common in men. In this connection the statistics of the Massachusetts General Hospital in gastric ulcer may be mentioned. In the last ten years, 1888-1898, one hundred and eighty-seven cases of this disease were treated in the hospital. Dr. Greenough and I found that mortality from hemorrhage was seventeen per cent. among the men, but only one and twenty-seven-one-hundredths per cent. among the women. Not a single woman died of hemorrhage under the age of thirty.

The second point is the use of a remedy which I think you will find mentioned more and more this coming year in the medical journals. Whether it will be of value is certainly questionable, as is the case with all such remedies, but it is well worth your attention, because several very good men have spoken favorably upon it. It is the use of a solution of gelatin in cases of aneurism and hemorrhage. It has been tried—not very successfully, I think I may say—in this country in aneurism. The remedy has been employed to check hemorrhage in cases of bleeding from the stomach, and also in cases of bleeding from other organs. Furthermore, by one man it was reported as successful in a case of *melæna neonatorum*. I have simply mentioned it because I am positive that the remedy will be tried a great deal in the next few months, and I am sure you will be interested to watch the reports as they come out.

Dr. Brackett.—I should be obliged if the gentleman would make it a little plainer as to the method of application of this medical agent,—whether it is local, or how applied.

Dr. Joslin.—Originally these injections of gelatin were given under the skin, and a two-per-cent. solution was used, especially in the cases of aneurism; but a great deal of pain ensued, and consequently a one-per-cent. solution was substituted. In other cases Dr. Paljakow gave the solution by the mouth and rectum; and in the case of *melæna neonatorum* a ten-per-cent. solution of gelatin was made on the spot and given by enema.

Dr. Brackett.—This is an aqueous solution?

Dr. Joslin.—Yes, an aqueous solution. The amount given was from two hundred to two hundred and fifty centimetres.

Dr. Briggs.—I have no right to speak on this subject, as I have never seen a true case of hæmophilia, but I have some bleeders, and can speak of the treatment in those cases in one or two instances that seemed to work rather favorably.

I do not believe in the iron solutions. It seems to me that they always irritate, and are very apt to be followed by still greater bleeding. And I do think that what has been said about rest, and particularly about a low diet, is a very important part of the treatment, and also the avoiding of any actual pressure. I have always done a great deal with antiseptic sponge, which is very much in the line of the gauze and has the same purpose, but I think it acts better than gauze. I speak particularly from the dentist's standpoint, in treating the sockets of teeth, and for that purpose the bit of sponge that is fitted to the shape of the socket—not to be larger, not to expand, not to crowd the socket, but fitted to put into the socket—has worked admirably in many cases.

And also, in condemning the iron solution, one ought to put something forward to take its place, and it seems to me that chloride of aluminum is an astringent that ought to be more widely appreciated than it is. I have recommended it to several surgeons, who have used it for hemorrhage where nothing else controlled it, and this has succeeded. A neutral solution of chloride of aluminum can be used in various strengths, and is very astringent, and non-irritating in that it does not produce inflammation. Of course, in strong solutions it is irritating, producing smarting, but it does not produce subsequent inflammation.

Dr. E. H. Smith.—As plaster of Paris has not been spoken of in the discussion, I would speak of its use in connection with the mechanical treatment for excessive bleeding. Take a pledget of cotton, saturate it with a styptic,—I commonly use tincture of kino,—and carry it into the socket; then saturate a pledget of cotton with plaster of Paris, and carry that in. Then take a part of an ordinary impression cup, such as we use for modelling compound. Fill that with plaster of Paris, and carry it down over the socket of the extracted tooth. This makes a perfect adaptation to the wound, the gum tissue, and the teeth about it.

I remember, when I was a student, of my preceptor, Dr. Shaw, treating a case in this way, with this exception, that he did not use the cup. He took a cork and fitted it to straddle the socket; then took a pledget of cotton, saturated it with tincture of kino, and

carried it well into the socket; placing over this another pledget of cotton saturated with plaster of Paris, and dipping the cork in plaster, carried it over all, and then put on the bandages. There was no further trouble.

I think that much depends upon the mechanical stopping of the wound so there is no outlet. This done, and there is no hemorrhage through the tissues, we have accomplished a cure.

Dr. Williams.—I am glad to hear Dr. Smith mention that point, external pressure, for that has been one of the most successful means by which I have met these cases,—the external pressure as well as the internal. The interior pressure sometimes gives a chance for the blood to ooze out, but put on the external like a clamp, and you keep it perfectly tight.

The plaster of Paris also is a good suggestion. I think it was first mentioned by the late Dr. Buckingham, of Philadelphia, several years ago. I heard him speak of having been very successful with it. I have tried it in some cases successfully, but this very essential point I wish to emphasize,—the necessity of the external pressure as well as the pressure in the socket.

Dr. Eames.—The extreme tendency to bleed in cases of hæmophilia is shown in the hemorrhage breaking out in other places after having been successfully controlled from the original source, hemorrhagic spots appearing upon different parts of the body.

Dr. Werner.—The chloride of aluminum is sold to dentists by dealers under the name of mauroline, and I wish Dr. Riggs had spoken of this, for I find many dentists evidently do not know it.

Dr. Brackett.—In an experience of more than a quarter of a century I have seen a considerable number of cases of serious bleeding following tooth extraction, but none approaching in severity the case reported by Professor Fillebrown. All my cases have been controlled with comparatively simple, non-irritating astringents, like tannic acid, in connection with comprehensive compression, persistently applied.

When these emergencies arise, the services of the dentist are among the most important which he can render. In numerous instances he saves the patient from very grave danger, not to say fatal results.

It is a curious expression of human nature that for this service, often demanded at the most unreasonable hours and under inconvenient circumstances, there seems in most instances but a dispropor-

tion to make any acknowledgment or compensation than for anything else which the dentist does.

Dr. Werner.—I look at the question a little differently. I think it is good instruction for us not to pull out the tooth. I am happy to say I do not have to extract many teeth.

Dr. Fillebrown.—I have been pleased to listen to a discussion so generally engaged in. It is worth all that our friend, Dr. Brewster, implied in speaking of the courage on the part of the operator in reporting the case being commendable. I certainly think it is worth all it cost me to be the cause of so interesting a discussion as this.

The sockets of the three roots were entirely plugged by coagulum. There was no oozing of blood from the sockets, and consequently any interference with them was unnecessary and was not attempted. The bleeding was on the edge of the gum opposite the root of the first molar. And I am quite sure that there was very little wounding of the tissue, as the roots were loose, and it is difficult for me to account for the fact that this one spot should have bled as it did.

I have never seen any ill results or any secondary bleeding from the use of persulphate of iron, and I have always considered it my right bower. While alum and other mild astringents answer well in perhaps a great majority of cases, yet when I need something that will do sure work, I always feel that I have in iron a resource that the milder astringents do not afford. It not only affects the blood and coagulates what comes in contact with it, but has a marked effect upon the terminal nerves, and causes a contraction of the terminal arteries.

I did not fully understand what Dr. Porter intended to convey by the "degeneration of the arteries" in the case of hæmophilia, whether or not it takes place in the short time that the bleeding continues, say, in the six days that intervened in this case between the operation and the end?

Dr. Porter.—Yes, I mean that in the six days, where the hemorrhage has been very severe and the person is suffering from anæmia, you get a very rapid fatty degeneration, especially in the cells. I do not mean that the arteries become actually thinner.

Dr. Fillebrown.—During the last few weeks I certainly have observed the conditions remarked by Dr. Daly and also a great amount of inflammation. Old teeth that have long been resting

quietly have suddenly become inflamed and often an abscess has formed. Last Saturday I extracted a third molar for one of our medical friends. This patient was in no sense a hæmophilic, but the next day he telephoned to me that it had been oozing blood all through the night. When I arrived there about noon it was still oozing a little. I removed the packing; it was somewhat colored. I washed out the wound with some hot water, and fortunately the bleeding stopped. It is very evident that trouble is in the air about this time of the year.

CHARLES H. TAFT, D.M.D.,

Editor American Academy of Dental Science.

ACADEMY OF STOMATOLOGY.

A REGULAR monthly meeting of the Academy of Stomatology was held at the rooms of the Academy, 1731 Chestnut Street, Philadelphia, on Tuesday, December 26, 1899, the President, Dr. E. C. Kirk, in the chair.

A paper entitled "Common-Sense Occlusion, or 'Bite,'" was read by Dr. W. Warrington Evans, of Washington, D. C.

(For Dr. Evans's paper, see page 221.)

DISCUSSION.

The President.—This is a very interesting and practical subject. I have no doubt that you are all anxious to break a lance with the essayist, and the subject is now open for your discussion. I see a number of gentlemen present who are not members of the society, and I wish to announce that the courtesy of the floor is always extended to visitors. We shall be glad to hear from our visiting friends. I shall ask Dr. Guilford to open the discussion.

Dr. S. H. Guilford.—I would like to ask Dr. Evans whether he thinks he gains much by having the mass of gutta-percha worked up in that way, instead of having the wax on the thin gutta-percha? I understand that he uses the gutta-percha for the purpose of giving greater stability, and on some of the trial-plates it is placed around it a quarter of an inch. He said it was desirable to have this plate as nearly like the finished plate as possible.

Dr. W. Warrington Evans.—Yes. Those two plates, or models, that were passed around were simply pressed up hastily last night

for this demonstration, and are thicker than I usually have them, but you will notice that the other plates which have the pieces of wax attached are thinner and have been better carved to shape. There is some thickness in the centre of the palate, which is not so noticeable to the patient, provided you have the bulkiness on the outside of the process removed. It would be, of course, greatly different in the finished plate, as one cannot cut the gutta-percha down so closely as in the finished plate. The point is well taken and requires explanation. Of course, when I said the "finished plate," I had reference more to the external than to the internal surface. I merely approximate the form. I would not make the palatal portion of my base-plate as thin as I would make a finished vulcanite plate for the mouth, as it needs stability. It is simply used to take the bite, and is not used after articulating the model. When "waxing up" the teeth I use nothing thicker than the thinnest rolled pink paraffin and wax, as it comes from the depots. Sometimes I use wax as thin as that from which artists make artificial flowers. I do not have two trial-plates, but use one base-plate to get the bite with, the other to set the teeth on after getting the bite. Neither are trial-plates, because I never see my patient until I finish the work. I never try the teeth in the mouth on the plate.

Dr. Guilford.—What advantage is there? There is a great deal more difficulty in working out that mass of gutta-percha to represent the outline of the teeth than to have the gutta-percha merely laid over the ridge and build it up with wax. Does it not require more time?

Dr. Evans.—It requires more time, and it is harder to do, without doubt, but when it is done it is rigid in form and remains firm, which is particularly advantageous in the summer time, for if one is going to spend ten or fifteen minutes with a patient getting a correct expression of the mouth, one will find that the ordinary wax will change its shape in the mouth owing to lack of rigidity. That has been my experience, to say nothing of time lost by trying the teeth mounted on wax in the mouth.

Dr. William H. Trueman.—I think the present is a very good time for reducing the rude methods of the past to a more scientific basis and getting down to finer lines. During the reading of the paper my mind has referred to the old-time methods of taking articulations, when a mass of wax was made into a ball and placed between the two plates while they were in the mouth (gold and

silver were generally used), the patient directed to close, and when in the operator's judgment the jaws were closed enough he took it out of the mouth and sent it to the laboratory; the mechanical dentist did the rest. It is astonishing how accurate they frequently were. It was a very rude way, but the operators at that time were used to taking articulations by that method, and knew about how to do it; and as spiral springs were generally used, a little malarticulation was less important than it is now. If we would try the same methods now, we would fail probably every time, but they did it and succeeded very frequently. Then, after that, the wax was divided, a portion was placed on each plate, and very accurately curved to the contour line of the intended teeth. That was sent to the laboratory, and the workman was expected to make the teeth exactly conform to these wax moulds. Indeed, in some cases we were required to make a plaster mould, and to fit the teeth up to that. Wherever that was done it was a failure, for the reason that the porcelain teeth could not be made to conform to the outline of the wax. It was easy to carve the wax, but difficult to go to the dental depot and find teeth that would fit. When the hand-curved blocks were used, those wax-guides came into use. In my practice, I begin to take the articulation when I first see the patient. In conversing with them, I try to fix in my mind what seems to be the normal and natural expression of the individual, and, having that in my mind when the time comes, I try to catch the point when that expression has been reached. I find it is a very good idea. I do not depend so much on carving the wax as I do on getting the idea in my mind of the natural expression. I think it is very good to reduce those things down, so far as may be done, to mathematical lines for the benefit of those who are beginning; it fixes in their minds what is a normal denture, and assists them very materially in arriving at that which is right and proper. At the same time, you must always remember that there is an eternal fitness of things to be considered. Teeth may be made according to mathematical lines and yet when placed in the mouth may be a complete botch, because they do not harmonize with that which the individual requires.

There is another point we very frequently lose sight of when speaking of the natural outline and the natural teeth in this connection. We forget that we never place an artificial denture in the same mouth from which the teeth have been extracted. When the time comes for placing an artificial denture in, that mouth has

changed so much that it is not the same mouth. It is utterly impossible to restore the expression as it was when the natural teeth were there. If you consider the difference between the gum when the teeth have been just extracted and the gum when shrinkage has taken place and got down to what we sometimes call "bed-rock," you will see that it is utterly impossible to restore the features as they once were. It is utterly impossible to put back the natural teeth after that has taken place. There is a general contraction of the tissues, and the best that we can do is to study the features and make them harmonize; make them look well, in other words. I think this is not always considered. How frequently I see remarks made in journals by speakers to the effect that the teeth at the depots are too small, that they are not the natural shape. The molars are particularly complained of as being too narrow, and as not having sufficient masticating surface, and the fact that there is not as much room at our disposal as there was when the normal denture was there is lost sight of. There has been a general contraction of the tissues, and the mouth is smaller. There is a great difference between the shrunk tissues and these same tissues when the natural teeth were there.

In reference to these expedients for making trial-plates, I much prefer swaged-up plate made of block tin. Where we have conveniences in the laboratory for making them they can be gotten up almost as quickly as these expedients can be. The tin plates are made to the approximate thickness of the intended vulcanite, and I find them very much more satisfactory in adjusting to the mouth, in getting the articulation, and adjusting the teeth when they are waxed in place. My own experience with wax plates and other devices has been that I generally have had to do my work over a second time. That is, probably, because I am not accustomed to using plates of that kind, so I find it more satisfactory to make block-tin plates. In all these matters that is best to which the operator is most accustomed,—that is, more accustomed to using. Some of my friends use wax plates and have no trouble. I prefer the block tin.

I was very much interested and impressed a year or two ago, upon visiting a dentist in the interior of Pennsylvania, to find him using Dr. Bonwill's articulator. I asked him if he used it to play with. He said he used it to work with—very emphatically. I said, "Do you find it useful?" He said, "Why, I cannot do without it." He never met Dr. Bonwill, nor did he know Dr. Bonwill's ideas as

regards the articulation and articulator, and yet had, in studying out the articulator, struck upon the idea. He said he found it very useful, indeed. Very frequently patients came to him from a distance, and he took the impression—took the articulation—and selected a set of teeth; the patients went away twenty or thirty miles, and when the case was finished he sent them by mail, and he very rarely had any changes to make. He had later seen the cases sent out that way when patients in passing through the town called on him, and he found them articulating very nicely, indeed. He said that until he had learned to use that articulator he was not able to work so accurately. I have tried to use it; several times Dr. Bonwill has tried to explain to me how to use it, but my head was too thick to take it in. I have not been able to use it with any degree of satisfaction, and yet those who seem to have done so find it practically useful.

I think one of Dr. Bonwill's great points was to so arrange the teeth that, no matter in what position the jaws might come together, there were always three points of contact,—one in the front and one on each side,—and so it was impossible in closing the jaws to tilt the plates. He explained to me a number of times how that could be done, how he accomplished it, but I have not been able to do it in my practice.

In arranging these matters I try to study the case and arrange it as experience seems to dictate; at the same time I think it is a very good idea to have these various practical points worked down to fine lines. We have learned by experience, while those who come after us will learn more quickly, and probably better, by precept.

Dr. McCullum.—I have been using Dr. Bonwill's articulator for three or four years, and like it for articulating teeth by Dr. Bonwill's system, which appeals to me because it is a system, and the only one taught. I never learned to set up teeth systematically until I got Dr. Bonwill's system of articulation. I finished a set of teeth to-day articulated by this method, and I found the occlusion very good.

Dr. M. H. Cryer.—I would like to say a few words in regard to this equilateral triangle of the lower jaw. When Dr. Bonwill made a visit to the University, about a year ago, we measured nearly all the lower jaws in the Dental Museum, and did not find a single jaw that came up to the requirements of the equilateral triangle as claimed by him. They vary as much as an inch one way or the

other; the condyles may be fully one inch closer than the distance from the centre of the condyle to the inner corner of the cutting edge of the central incisor, or again they may be one inch under. Yesterday while at the Dental Department of the University of Pennsylvania I picked up a skull, and taking a pair of dividers, measured the lower jaw, and found that the measurements between the centres of the condyles and from the centre of the condyle to the central incisors were exactly the same, giving a true equilateral triangle. Upon further investigation I found this skull had belonged to the collection of the late Dr. Bonwill, which his daughter had presented to the Department of Dentistry of the University of Pennsylvania. I presume that it was upon measurements from this skull that Dr. Bonwill based his discovery. Had he examined a skull of one of the Fan tribe of Africa he would have found the distance from the condyles to the incisors to have been three-fourths of an inch longer to the centre of the other condyle; or, had he taken the skull of a Chinese or a North American Indian, he would have found the reverse condition. These skulls are in the Department of Dentistry of the University of Pennsylvania; those who may visit the museum can make the measurements for themselves. There are examples from many races, among them Europeans, Asiatics, Africans, and various tribes of the North American Indians, and the only skull in that collection that will give you the equilateral triangle is the one belonging to Dr. Bonwill's collection. This gives one more illustration of the fact, so hard to understand, that the typical jaw, or the true type of any physical perfection, is the one most difficult to obtain, and, as our text-books generally only define these, we seem to be always dealing with abnormalities.

Dr. Albert P. Brubaker.—There is but one word I would like to say in reference to the data and the measurements of the equilateral triangle. If I recollect aright, Dr. Bonwill stated in his original paper that he had examined the jaws of some two thousand skulls in the collection of the Academy of Natural Sciences in this city, which embraces skulls of a great variety of races, and that his results represented the general average of many measurements.

I would also call attention to the fact that the want of correspondence between the scientific interpretation of the equilateral triangle and the practical application of the same is largely due to an arbitrary and non-geometrical construction not only of the relative sizes of the teeth, but also of their relative positions. This

method of Dr. Bonwill has been carefully analyzed and refuted by Dr. Alfred Gysi, of Zurich. Those who have carefully read Dr. Gysi's paper will be readily convinced that Dr. Bonwill's construction is geometrically and physiologically incorrect.

Dr. G. C. Chance.—I am very much in favor of this old-fashioned articulator that Dr. Evans has suggested. I have seen it work beautifully where "all others failed."

Dr. H. Gaskill.—Dr. Bonwill one evening said that he had never seen but one case in which the natural teeth had movement contacts corresponding to those given to artificial teeth by his method of articulation. That was in the case of an elderly gentleman who had one or two teeth missing, but in the movement of the jaw there were three points of contact of the teeth.

Dr. A. H. Thompson.—The essayist did not touch upon the question of lateral movement in occlusion, which, of course, is a very important one in articulating the teeth, and while the main position is that in which the jaw is at rest, still we must consider the movements of the jaw in the process of mastication of food, which is often a very important matter. There is very considerable excursion of the human jaws allowed, but owing to the depth of the glenoid cavity in the human subject it is somewhat restricted. We are in the habit of giving the patient some directions regarding the use of artificial plates, to bite just so, or to use them in particular ways. I think that Dr. Bonwill has really given us some ideas as to the movements of occlusion which are valuable and which may be applied to the adjustment of artificial teeth with reference to mastication.

Dr. James Truman.—I was very much gratified with Dr. Evans's exposition of his subject, all the more, perhaps, because I always used, when I was making artificial teeth, the old plaster extension articulator, and I can fully endorse its value. I do not think that I have at any time articulated a set with the modern articulator, and have practically used the method of Dr. Evans, although not making use of gutta-percha. I have never felt that confidence in articulation which would enable me to send a set of teeth by mail with the anticipation that it would answer without subsequent grinding. I hardly can understand how that can be accomplished. I would like to hear from Dr. Evans on that point.

Dr. G. W. Cupit.—One point has been brought out very nicely, and that is, that in the arrangement of the bites the outline of the

finished plates is followed more closely. Dr. Evans works more accurately than is the custom of the average dentist. We are apt to make our bites thicker and fuller, possibly interfering with the proper occlusion and proper expression, and for that reason we do not get accuracy of occlusion or expression. I think the accuracy in the finished plate is due to the accuracy of the bite-plates. If they fit nicely and are well shaped, so as not to interfere with the action of the muscles or the expression of the lips, we may naturally expect the finished plate to be the same, and to me this is where the accuracy is accomplished, and is why the finished plates can be sent by mail or express with comparative certainty that they will be correct.

At the same time, I wish to discourage the practice of taking what is called the "mush bite," putting in a large lump of wax, sufficient to nearly fill the mouth, and having the jaw come into contact with that, and feeling that it is a correct or even an approximate bite. It is not. I think the more nearly our bites and bite-plates are arranged to represent the finished plates the more nearly correct will be the finished plate.

Dr. S. H. Guilford.—We all know what Dr. Bonwill's skill was, and we know of Dr. Evans's skill. Dr. Bonwill insisted upon using his anatomical articulator, and in that articulator he not only got the vertical, but also the lateral and rotary motions, and he also, in addition, by means of a skeleton articulator, was enabled to look from the inside and see how the inner cusps occluded. He thought it was essential, and that a set of teeth could not be properly arranged except by an articulator made on that principle. Dr. Evans says he has no need of an articulator of that kind, but uses a fixed articulator, yet he meets with the same success that Dr. Bonwill did. Therefore it seems to resolve itself largely into a matter of personal equation, a great deal depending on the individual, each doing his work in his own way. Dr. Evans works with exceeding nicety and exactness, as he has shown to-night, but, aside from that, I do not see that there is anything of great importance in his methods; in other words, two men, equally skilful, get the same results by different methods. So it all depends very largely on getting correct occlusion in the first place, no matter how you get it, and after that is done, setting the teeth in such a manner that they will restore the expression and properly perform the functions of mastication and speech.

Dr. Evans.—Gentlemen, you certainly have been very kind in your criticisms. I once asked a gentleman, who is very skilled as a government photographer, what plate was the best that I could use for photographing. He said, "There are several good plates, but my advice is to select one of those plates and master it. If you change from plate to plate, you will not succeed, but if you will take one good make of plate and learn all its difficulties, you will be able to manage photography." And so it is in regard to dentistry. Now, as to taking the bite. There may be some who will accomplish it by using wax alone, others with gutta-percha or tin, and so on; but, after all, the secret of making a product which will not require grinding does not depend upon my articulator or occlusion-plate alone, by any means. If after getting perfect occlusion I do not give attention to all the little details of manipulation of materials, they would not be so exact as not to require articulation in the mouth. In vulcanite work, if you pack very heavily or have a very thick plate, where you can have contraction or expansion, or place a large amount of material in between the two halves of the flask and attempt to force it down with bolts, you will have unsatisfactory results, and no matter how perfect your occlusion may have been in the beginning, you will have grinding to do. On the other hand, learn to pack extremely close with vulcanite, so that there is a very thin margin of excess, and use a flask without bolts, such as have come in lately, with a spring clamp to close it. If there happen to be the least inaccuracy in closing the flask, the spring clamp will complete the operation when the material has become more plastic under the high heat of vulcanizing. While these are small details, yet they are essential to obtain perfect results; you must follow out all details.

In reply to Dr. Cryer's remarks relative to measurements of the jaw, I may say that my experience happens to be different from his. I believe a great deal depends upon the nationality of the skull examined. He happened to have a line of skulls from certain nationalities at the University of Pennsylvania. I happened to go to the Government Museum, where there are two or three thousand skulls of Indians and about fifteen hundred or so of other skulls,—Caucasians, negroes, and so on,—and my observation was that more than one-half of the lower jaws would stand the measurement for an equilateral triangle. The other half would vary not more than one-quarter of an inch from it. As I said before, it does not make

any difference whether it is an equilateral triangle or a trapezoid, provided we happen to have a means of taking the individual bite. We must adapt ourselves to circumstances. I thank you very much, gentlemen, for your kind attention.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

MASSACHUSETTS DENTAL SOCIETY.

(Continued from page 133.)

OWING to the late hour, Dr. Bogue's paper, on the "Consequences of the Extraction of Permanent Teeth," was not discussed. (For. Dr. Bogue's paper, see page 305.)

CLINICS.

Dr. W. I. Brigham, of South Framingham, demonstrated a new cervical clamp, a gold holding attachment for mouth mirror, together with some specimens of finished work. He also gave a clinic on burnishing gold fillings.

Dr. P. W. Soule, of Monson, gave a clinic illustrating the use of soft pine wedges.

Dr. F. L. Marshall, of Boston, gave a clinic on his new method of putting in porcelain inlays in approximate cavities in front teeth, in such a manner that they are practically as durable as all gold filling. It is a combination of porcelain and gold. The gold occupies all the cavity except that in the line of vision looking at the front of the tooth. The gold is put in in such a way that it forms a box for the porcelain to set in. Dr. Marshall also gave an exhibition of staple crowns. These furnish the basis for bridge work, and have the merit of showing no gold on the face of the tooth.

Dr. Burton C. Russell, of Keene, N. H., gave a clinic on inlaid porcelain work in approximate cavities.

WALDO E. BOARDMAN, D.M.D.,
Editor Massachusetts Dental Society..

Editorial.

IS DENTISTRY A CHARITABLE PROFESSION?

THE question of charitable work in dentistry was introduced at a recent meeting of The New York Institute of Stomatology by a paper presented by Dr. A. J. Flanagan.

The discussion of this essay brought out the views not only of the dentists present, but also those of several prominent visiting members of the medical profession. The full report appeared in the April number of this journal.

The question is one by no means new, for it is as old as dentistry, but it has probably not been presented before in a concrete form for discussion and general consideration.

It is proposed in New York to establish a dental dispensary for the treatment of the poor, and some of the members present were willing to devote a half-day in each week gratuitously to this service. The adoption of this plan is not an original effort, for it was tried and failed in Brooklyn some years since.

Medical men have repeatedly stated that dentistry could not be called a profession for one important reason,—that it did not give its services free to the poor; and this charge was repeated at this meeting. It was also charged that dentists would not give their time to the dispensaries unless paid for the service. In fact, it was assumed that dentistry had no dispensaries, and did practically nothing to relieve the crying needs of the *great undercurrent* life of our large cities. It was further broadly stated that the work performed at the colleges stood in no near relation to that of the dispensaries connected with hospitals, or those working independent of them.

The relation which dentistry holds to the general public is not well understood by medical men. They seem incapable of comprehending the wide distinction to be drawn between dental and medical practice, and, therefore, when they assume to define a profession as a body of men serving the poor gratuitously, and that dentistry, failing in this, is therefore not a profession, they simply

fail to comprehend the true character of dental work and its limitations.

Is it true that dentists do nothing in the way of professional charity? To answer this some allusion must be made to the beginning of dentistry as a profession. This must be dated from the first organization of a dental college by Dr. Chapin A. Harris in 1839. It was clearly evident to this broad-minded man that a college without a dispensary attached would be a failure. His idea extended beyond that of the medical dispensary in that he regarded the combination of free service and practice as part of the educational training. This was not new, for it was similarly regarded in medical dispensaries, but with this marked difference, the medical dispensary was given over to a few favored graduates, while the majority of medical students were deprived of all practical experience. On the other hand, the dental dispensary was made the means of increasing practical skill and fitting thereby the undergraduate with an experience upon the living subject enabling him at once, on entering the larger arena of practice, to fulfil all the duties of his profession. The result of this initial experiment was so satisfactory that there is not a dental college in the world to-day that does not regard its dispensary as the most important part of its training. Indeed, without it there is not a dental college that could possibly be sustained. Hence the "clinic," as it is generally called, is jealously guarded and every effort made to encourage the poor to attend and receive careful attention under the care of competent instructors.

It will doubtless be said, indeed was intimated in the discussion, that this was not the charity desired. In fact, it was not charity at all, and could not be classed with medical dispensaries, where treatment was given without charge to those absolutely unable to pay for medical service. This may be true, but if so, why the denunciations in medical journals of these same dispensaries that they do not confine their work to the real poor, but that large numbers able to pay are recipients of the service; in fact, that no discrimination is made, thus taking the bread from the mouths of young practitioners. The same cry has been heard over and over again in regard to dental clinics, and it is no doubt true that sufficient care is not observed in both of these departments of practice.

Will the establishment of the dental dispensary, separate from

college work, overcome this difficulty? The answer must be decidedly in the negative. Human nature is the same everywhere. To get something for nothing is a constant temptation, and the expedients resorted to to accomplish this would, if told, be an interesting history both in medical and dental experience.

Is it possible to work for the very poor in dentistry? This is another very large question. When the practice of dentistry is compared with that of medicine, we are met at the threshold of our inquiry with the fact that methods of treatment stand in no harmonious relation. The medical practitioner can make a hasty examination of this patient, write a prescription, occupying perhaps five or ten minutes of time; another patient is then taken. The work of the surgeon comes more nearly that of the dentist. The specialists, as the ophthalmologist, aurist, laryngologist, etc., occupy also very close relations, but even these, in point of time consumed, or in exhaustive labor, cannot compare with dentistry, nor is the work as disagreeable in some of its aspects. Now, what has the dentist to meet? He must first have a complicated set of instruments. These must be supplied, in part at least, by those in charge. He must have each patient under his care for at least an hour, possibly longer. He is brought necessarily in very close contact throughout that period, and must suffer all the disagreeableness of this close communion with the great unwashed; and then, to crown all, he knows that his effort will be entirely nugatory through the wretched environment of these people and the utter neglect of all hygienic conditions in the oral cavity. Can any one think of treating gingivitis, pyorrhea alveolaris, and the host of pathological conditions in mouths in which the tooth-brush is an entire stranger? All know that such treatment could have no good result. It is a dream of the philanthropist, to be dissipated by the stern realities of fact. Admitting that these obstructions to good practice could be overcome, how could this class give the time necessary for extended dental operations? The question varies with its own answer: it is impossible. Until the slums have ceased to exist, and men and women are raised to a higher level, the forceps will continue to be the instrument of relief. There is not a right-thinking person but would wish it otherwise, but the stern logic of facts makes this impossible in our present imperfect civilization.

There is another class, very limited in means, that can be bene-

fited, and it is to this body of men and women that true charity may be extended. This may be represented by girls engaged in various avocations, young men of limited means supporting a family on a meagre income, children in our public institutions, institutions for the insane, etc. Provision is made in all our large cities for a portion of this class in institutions, but the provision is entirely inadequate to the demand for dental service. In smaller towns this problem remains unsolved, and seemingly no attempt is being made to effect a solution either in medicine or dentistry.

This brings the subject to the consideration of the college clinic. Does it bear a true relation to the medical dispensary, and is it in any sense a charitable institution? It is somewhat difficult to answer this question, for this would require a very extended knowledge of the practice in vogue in various dental colleges. It is assumed, however, that this is very much the same in all, and the endeavor, universally, is to bring all operations to nearly absolute cost. One college known to the writer makes no charge whatever for anything but operations with gold in the dispensary, and absolute cost for all other operations. All dental dispensaries could not do this, as the great expense would constitute a severe strain upon the resources of the institutions, hence a small fee in some is demanded. The operators in all cases are the students, with occasional personal assistance in difficult cases. In oral surgery all operations are, of course, free, and these are performed by the professor in charge.

It is impossible to conceive of any dispensary on an independent foundation that could do more than this. If it were started on an entirely free basis, its life would necessarily be very brief. Somebody must continually pay the bills, as well as give the time, two things that speedily end in the conviction that "true charity begins at home." If some philanthropist could be found to endow an institution of this kind, it is feared it would eventually degenerate into a poorly conducted school for undergraduates.

When medical men assume that the dental profession fails in its duty in not attending to the wants of the poor, or those of limited means, they talk in ignorance. It is safe to presume that these have never entered the dispensary of a well-equipped dental college during the busy hours of the day. The institution with which the writer is most familiar has one hundred chairs in one department, usually all filled with patients waiting. The last re-

port of this college gave a record of 7235 patients and 18,638 operations in the operative dispensary, of which, 13,578 were absolutely free. This amount of charitable work could hardly be equalled by any private dental dispensary, however well conducted; and when the amount of labor involved is taken into consideration, it could probably not be approached by any medical institution. It must further be considered that in the same city there are three other dental schools all doing proportionate good work in the same direction. The criticism will probably be made that all this is not true charity, as it lacks the altruistic motive. While it is true there is a selfish side to it, the same plan exists in medical dispensaries. They are not established for the entire good of the patients. It is a question whether self is ever entirely eliminated from benevolent deeds. The answer to all such criticism must be found in the result that thousands are helped and, what is of equal importance, are being instructed in the care of the oral cavity, and thereby helping to prevent not only disease there, but throughout the entire organism.

While the writer is in full sympathy with the general trend of thought in that discussion, it does seem that with our charitable views we should combine the practical possibilities, and these would appear to be confined to the colleges that are alone capable of bringing together the needy, willing to suffer, and the undergraduate willing and eager to work.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE official announcement of the meeting of this body will be found upon another page. It is to be regretted that any change has been made from the old and long-established plan of meeting in advance of the National Dental Association. It is feared it will not be in the interest of either of these two important organizations. It would seem a judicious move to change to the original method of meeting in advance of the National organization. If this is not done, the latter association will suffer in the non-attendance of the men most needed to give it vitality.

Bibliography.

THE PRACTICE BUILDER. A Treatise on the Conduct and Enlargement of Dental Practice. By Charles R. Hambly, D.D.S., author of "The American Dental Instructor," "The British Dental Instructor," etc. Fifth Edition. Cincinnati and New York, American Dental Publication Co., 1897.

This book was prepared by the author, as he expresses it, "because it is needed."

This the fifth edition is marked on the title-page 1897. Why it has not received extended notice previously must be explained by the author. The fact that it has reached five editions indicates "that it fills a want long felt" by a certain class of operators.

It seems a formidable task for the reader to wade through six hundred and sixty-eight pages devoted to advice in building and maintaining a dental practice, and doubtless the first thought on picking up this bulky volume will be that the author has simply used a mass of verbiage to express a few ideas. This conception would, however, be very far from the truth. While it must be acknowledged that the book has been extended beyond all reasonable limits, and might be reduced to one-third its size to advantage, it contains much that is valuable, and generally so clearly stated that the reader finds himself unconsciously following in the train of the author's thought without criticism as to the redundancy of words and the repetition of ideas.

That a book of this kind is a need not only in dentistry, but in medicine, must have been apparent to all observers, and it is with regret that the author has seen fit to combine with the good much that must be condemned. Professional men are, as a rule, poor business men. A few have had a preliminary training in this direction, and they are generally successful, but the majority enter the professions direct from the schools, with the result that they fail to unite business habits with their professional work. It is not at all uncommon to find professional men incapable of opening a bank account or to keep it properly when opened.

There is no question of more importance to the young graduate

than that of conducting a practice, and the voluminous advice contained in this book should aid in this, for there is much in it to which no exceptions can be made. It must be accepted as a truism that, however much a professional man may desire to separate himself from trade, the methods that insure success there must, to some extent, be adopted if satisfactory results are to be obtained.

The book opens with the Code of Ethics of the American Dental Association adopted August, 1866. This is well, but the author fails to live up to it on page 423, where he gives a chapter on "Advertising," which from the reviewer's stand-point is not only at variance with the aforesaid code, but is contrary to professional thought and practice. While it is true many men quietly violate the code, and secure, through devious ways, notices in the press, it does not, therefore, follow that the question has not an important ethical side. The author, in discussing this subject, seems to feel "that there are two kinds of advertising,—good and bad,"—and then proceeds to explain the difference, and devotes large space to informing the beginner and practitioner how to advertise intelligently. From a business point of view no exception can be made to his advice, but when he gives examples, after the manner of the "Ready Letter-Writer," how to write advertisements, he steps over the boundary of ethics into the region of "dental parlors," and thus divorces his work from professional right thinking.

This portion of his book is considered here, for in the reviewer's opinion it forms the worst feature of an otherwise generally satisfactory publication. That it will be a veritable treasure-house to the advertising dentist is assured. Pages are given to illustrate the author's opinion of what constitutes "sensible, argumentative announcements," and then follows dental parlor advertisements in America, England, and on the Continent. While the motive of the author may be to discuss good and bad methods of advertising, the true professional man will have nothing to do with the book; for to his mind the good in it is completely neutralized by this chapter. Were it not for this good in a higher business sense, this book could not have found a place on our reviewing pages.

Aside from this there is an element of mystery about it that is not understood. It is handsomely printed upon coated paper, presenting a volume unexceptionable in general make-up, and yet the author places on the cover the word "Confidential." Why this, if intended for the profession at large?

Had the author presented this book free from the objections referred to, a more favorable review would have been given, but as it stands, it must be regarded as contributing to the worst features of modern dental practice, illustrated by the dental parlors of all our large and most of the smaller cities, lowering the standard of dentistry as never before in its history.

Obituary.

RESOLUTIONS OF RESPECT TO DR. W. D. TENISON.

At a meeting of the First District Dental Society of the State of New York, March 13, 1900, the following resolutions were presented by Dr. John I. Hart, and adopted:

WHEREAS, Dr. William Deane Tenison has been removed by death, it becomes our painful duty to take notice of his demise; therefore be it

Resolved, As the sense of this society, that in the death of Dr. Tenison the profession has lost a distinguished member. As a man Dr. Tenison was genial and affable; as a dentist he was skilful and conscientious. Entering upon the study of dentistry at an early age when all was crude, he wrought his way to success and high position by zeal and industry. We shall miss Dr. Tenison from our ranks. Let us therefore linger for a moment to pay his memory this tribute of respect.

Resolved, That a copy of these resolutions be sent to his family and the dental journals.

B. C. NASH,
Secretary.

Current News.

NATIONAL DENTAL ASSOCIATION.

THE meeting of the Association which was to have been held June 26, at Old Point Comfort, has been changed by vote of the members to Tuesday, July 10. Reports from officers of sections indicate that a very high order of work will be done at this meeting. Men have been selected to write papers because of their pecu-

liar fitness for the undertaking, and enough of these invited have accepted to insure a full programme. A special feature will be clinics, under the supervision of Section III. It is hoped that the attendance will be as large as it was last year at Niagara.

B. HOLLY SMITH,

April 9, 1900

President.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY.

THE next meeting of the American Medical Association will be held at Atlantic City, June 5 to 8, 1900. The Section on Stomatology presents the following programme:

SYMPOSIUM ON DENTAL EDUCATION.

Relations of Dental and Oral Surgery to General Medicine; Professional Status of Properly Educated Practitioners of Dental and Oral Surgery, Dr. N. S. Davis, Sr.; Preliminary Qualifications, Dr. J. Taft; Course of Study, Dr. W. A. Evans; Methods of Teaching (Didactic or Recitatorial), Dr. A. H. Peck; Shall the Dental Student be educated independently of General Medicine? Dr. G. V. L. Brown; Is Medical Education a Necessary Qualification for Dental Practice? Drs. Alice Stoeves and R. R. Andrews; The Practical Value of a Medical Education in Dental Practice, Dr. W. B. Hill; Technical Training *vs.* Theoretic, Dr. John S. Marshall; Should the Medical Undergraduate be instructed in the Principles of Dentistry? Dr. M. L. Rhein; Post-Graduate Study in Dentistry, and Degrees therefor, Dr. W. R. Walker; Handwriting upon the Wall: What does it portray? Dr. A. E. Baldwin; Limitations, Dr. Eugene S. Talbot.

SYMPOSIUM ON INTERSTITIAL GINGIVITIS, OR SO-CALLED PYORRHEA ALVEOLARIS.

Etiology, Dr. G. Lenox Curtis; Neurotic Affections, Dr. J. G. Kiernan; Indigestion Auto-intoxication, Dr. Eugene S. Talbot; Chemical Factors in Etiology, Dr. W. L. Baum; Constitutional Treatment, Dr. J. H. Salisbury; Local Treatment, Dr. M. H. Fletcher; So-called Glands in the Peridental Membrane, Dr. M. H. Fletcher; The Evolution of Decay continued, Dr. Arch C. Hart; Co-operation of the Public Schools in Teaching. Good Teeth.

Good Health. Whatever we wish to introduce into the life of a nation must be introduced into its schools, Dr. Richard Grady; Subject to be announced, Dr. V. A. Latham.

The Section on Stomatology will meet at Hotel Senate. The officers of the section invite all to be present and to take part in the discussions.

Those who wish to join the Association must obtain credentials from their State or local Dental Societies and pay five dollars to the Secretary of the Association. This will entitle them to the Journal for one year.

Accommodation can be had by writing F. B. Cook & Son, Hotel Senate.

EUGENE S. TALBOT,
Secretary Section on Stomatology.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE National Association of Dental Faculties will meet at Old Point Comfort, Va., on the afternoon of July 13, 1900.

J. H. KENNERLY,
Secretary.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-second annual meeting of the New York State Dental Society will be held in the New Centennial Hall, corner Lodge and Pine Streets, Albany, N. Y., May 9 and 10.

The following programme is announced: President's Address, F. Le Grand Ames, D.D.S.; Correspondent's Report, R. Ottolengui, M.D.S.; Report of Committee on Practice, H. D. Hatch, D.D.S.; Essays, F. A. Capron, D.D.S., Toronto; Joseph Head, D.D.S., Philadelphia; Edward C. Kirk, D.D.S., Philadelphia; S. B. Palmer, M.D.S., Syracuse; Chas. H. Barnes, D.D.S., Syracuse; Milton F. Smith, D.D.S., New York.

F. LE GRAND AMES, *President.*
W. A. WHITE, D.D.S., *Secretary.*

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

IN consequence of a contemplated new movement by the Association, with the probability of considerable benefit both to the State Boards and the more advanced colleges whose educational standards are high, the secretary most earnestly requests from the officers and members of the several State Boards in the United States and Territories a new list of officers and members.

An early compliance with this request will be most heartily appreciated.

CHARLES A. MEEKER, D.D.S.,

Secretary.

29 FULTON STREET, NEWARK, N. J.

KENTUCKY STATE DENTAL ASSOCIATION.

THE thirtieth annual meeting of the Kentucky State Dental Association will be held in Louisville, beginning May 29, 1900, at nine A.M., and continuing three days.

Following is the preliminary announcement of papers to be read:

Some Advantages of Non-Cohesive Gold, Dr. J. R. Clayton; Amalgam: Its Preparation, Instruments, etc., Dr. W. E. Harper; Oral Manifestations of Syphilis, Dr. T. C. Evans; X-Rays in Dentistry, Dr. L. E. Custer; Subject to be given, Dr. S. A. Donaldson; Malaria as a Cause of Secondary Hemorrhage in Extraction of Teeth, Dr. J. P. Shaw; Orthodontia, Dr. C. DeWitt Lukens; Orthodontia, Dr. E. D. Rose; One of the More Especial Duties of the State Dental Association, Dr. J. L. Sulphin; Care of Deciduous Teeth, Dr. J. F. Meadors; Subject to be given, Dr. L. B. Howell; Dental Education, Dr. Theo. Menges; Practical Dentistry, Dr. E. T. Barr; Troublesome Cases in Bridge-Work, Dr. U. D. Hulick; Teeth, Dr. W. S. Williams; Metallic-Plastic Work and backing Porcelain Teeth, Dr. R. C. Reoph; The Status of Mechanical Dentistry, Dr. O. G. Wilson; Diseases of the Antrum, Dr. Adolph O. Pfingst; The Reproduction of Gum Tissue in the Inter Proximam Space, Dr. Geo. T. Carpenter; Subject to be given, Dr. J. H. Baldwin; Subject to be given, Dr. A. H. Peek; The Importance of Proper Physical Diagnosis in the Practice of Dental Surgery, Dr. J. Y. Crawford; Gold Filling as

Gold Crowns, Dr. W. T. McLean; Antiseptics and Disinfectants, Dr. Geo. W. Cook; What Efforts are we using to better the Profession? Dr. M. H. Dailey; Cast Aluminum Dental Plates, Dr. Willard Streetman.

CLINICS.

Oral Surgery, Dr. Wm. H. G. Logan; A Method of backing up Porcelain Crowns, Dr. E. D. Rose; Removal of Dental Pulp Surgically, Dr. J. Y. Crawford; Soft Gold Filling, Dr. P. A. Pennington; Metallo-Plastic Work, Dr. R. C. Brophy; A Compound Gold Filling Crown and Posterior Proximal with Matrix, Dr. B. Oscar Doyle; Porcelain, Dr. H. J. Goslee; Immediate Nerve-Extraction with Eucaïne by Pressure and Root-Filling, Dr. S. A. Donaldson; Orthodontia, Dr. C. DeWitt Lukens; De Trey's Gold, Dr. C. K. Runyon; Orthodontia and Exhibit, Dr. Frank L. Smith; Contour Fillings with Soft Gold on Models, Dr. G. S. Junkerman; The Use of Snow Face Bow in taking a Base Plate Bite, Dr. J. Q. Bryam; Subject to be given, Dr. J. R. Clayton; A Few Cases in Orthodontia, Dr. J. S. McClurdy; Soft Gold Filling, Dr. Henry Pirtle; Subject to be given, Dr. W. E. Grant; Combination Gold Filling, Dr. E. L. Sanders; Open-Faced Crowns, Dr. B. G. Reese; Extraction of Teeth Under Local Anæsthesia, Dr. F. R. Wilder.

The following gentlemen will give clinics, subjects to be given: Dr. G. C. Roberts, Dr. F. L. Klingman, Dr. W. W. Barnes, Dr. A. B. Weaver.

Twelve firms have secured space for displays.

The committee, in addition, have under arrangement other important clinics, and are making strenuous efforts to make this the best meeting ever held in the State and well worthy your attendance. Members of the profession are cordially invited.

F. I. GARDNER, D.D.S.,

Secretary.

DENTAL COMMISSIONERS OF CONNECTICUT.

THE Dental Commissioners of Connecticut will meet at the Capitol in Hartford, Monday and Tuesday, May 14 and 15, 1900, for the examination of candidates for license and attend to any business proper to come before them.

Practical examination in operative and prosthetic dentistry at ten o'clock, Monday, May 14.

The written theoretic examination Monday evening, May 14, and Tuesday, May 15.

Candidates holding temporary permits, and coming under the rules in force prior to January 1, 1900, must appear Monday, May 14, between the hours of ten A.M. and two P.M.

All persons desiring to practise dentistry in this State must apply to the Recorder for *revised rules* and for the proper blanks. Blanks must be carefully filled in and sworn to, and with the fee, twenty-five dollars, filed with the Recorder at least one week before the day of examination.

GEO. L. PAEMBLE, M.D., D.M.D.,
Dental Commissioner and Recorder.

HARTFORD, CONN. April 6, 1900.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE National Association having changed the date of its meeting, for this year, to July 10, the Pennsylvania State Dental Society will meet on July 5, 6, and 7, at Reading, Pa. By order of the Council.

ROBERT HUFF,
President.

ILLINOIS STATE DENTAL SOCIETY.

At the annual meeting of the Illinois State Dental Society, to be held in Springfield, Ill., May 8, 1900, the following papers will be read:

President's Address, Dr. R. N. Lawrence; Report of Committee on Dental Science and Literature, Dr. A. W. Harlan; Report of Committee on Dental Art and Invention, Dr. H. J. Goslee; Gold Crown with Solid Carved Cusps, Dr. J. E. Nyman; A few Thoughts on Prosthetic Dentistry, Dr. W. W. Moorhead; Simple Method of Treatment of Fractures of Lower Jaw, Dr. W. A. Johnson; Calcification a Controlling Factor in the Treatment of the Teeth, Dr. Grafton Monroe; Habits Incident to the Dental Profession, Dr. G. W. Ensminger; Electricity through the Ages and its Value with regard to Dentistry, Mr. G. E. Loh, M.E.; Pyorrhea Alveolaris, So-called, Dr. A. H. Peck; Operative Dentistry: (1) To emphasize some things in Operative Procedures, Dr. D.

M. Cattell; (2) Subject to be announced, Dr. Edmund Noyes (it is expected that Dr. Black will open the discussion on both of these papers. The discussion on this subject not to be confined strictly to the papers read); Antiseptics, Dr. Elgin MaWhinny; Report of Supervisor of Clinics (the clinical work will be fully represented, twenty-five operators having signified their intention to be present), Dr. A. J. Hinkins.

MISSOURI STATE DENTAL ASSOCIATION.

THE thirty-sixth annual meeting of the Missouri State Dental Association will be held July 10, 11, 12, and 13, 1900, at Louisiana, Mo. A cordial invitation is extended to all reputable dentists to attend.

B. L. THORPE,
Corresponding Secretary.

CHICAGO DENTAL SOCIETY.

THE following list of officers of the Chicago Dental Society for 1900-1901 were elected at the annual meeting, held in the Stewart Building, Tuesday evening, April 3, 1900:

President, Geo. W. Cook; First Vice-President, Geo. B. Perry; Second Vice-President, H. J. Goslee; Secretary, Elgin Ma Whinney; Corresponding Secretary, C. S. Bigelow; Treasurer, A. B. Clark; Librarian, H. W. Sale; Member Board of Directors, J. E. Hinkins.

Board of Censors.—W. V.-B. Ames, Chairman, C. N. Johnson, A. W. Harlan.

C. S. BIGELOW,
Corresponding Secretary.

100 STATE STREET, CHICAGO, April 25, 1900.

THE
International Dental Journal.

VOL. XXI.

JUNE, 1900.

NO. 6.

Original Communications.¹

NEW REMOVABLE FACING.

BY CEPHAS WHITNEY, D.D.S., JAMAICA, W. I.

MR. PRESIDENT AND MEMBERS OF THE ACADEMY OF STOMATOLOGY,—The very kind and favorable manner in which the keyed tooth facing and backing (which I shall present for your consideration to-night) has been received by many of your prominent members, has emboldened me to accept Dr. McQuillen's invitation to bring it to your notice.

Preliminary to going into the merits of my device, it may be well to touch on the main reasons which have made a non-soldered, easily repaired facing desirable.

Porcelain is a necessary weakness in dentistry; though possessing nearly every other virtue, such as natural color, cleanliness, and hardness, its ultimate dental strength is very disappointing.

From an engineering point of view, porcelain teeth should be at least double the strength of the force that can be naturally brought to bear upon them. This force we know to be in the neighborhood of three hundred pounds in exceptional cases; therefore, a tooth,

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

to comfortably support or resist this strain successfully, should have a natural breaking-point of six hundred pounds.

Fortunately, three hundred pounds is far in excess of the power that is possible for the average person to exert, and what muscular force they are able, or, better still, do ordinarily bring to bear, is usually distributed over several teeth. These facts, taken in conjunction with the movement, or given in plate work, the protection afforded by thick metal backings and incisal and occlusal metal extensions, explains why porcelain facings stand as well as they do.

The usual method of testing porcelain teeth by the makers gives them an erroneously high breaking point of from forty to one hundred pounds. In their method, only the pins project through an opening in a metal plate and are grasped by the drawing-tongs of the dynamometer. You will perceive that by this plan every part of the lingual surface of the facing is subjected to an even strain, of practically no leverage on the pin portion of the tooth. This is wrong, as they should be tested incisionally in imitation of the natural strain.

I believe that I will be unchallenged when I state that soldering injures facings in strength, that they are, even at the best, far weaker than good engineering calls for, hence their constant fractures and the well-known need of an easily repaired satisfactory facing. I have found by testing that the average soldered facing will fracture at about eighteen pounds' pressure on the incisoral fifth; whereas my removable facings fracture at about twenty-five pounds, and the reason for this gain will be shown later on in this paper.

But the facility for quick and perfect repairs is only one of many points that recommend the tooth. I will now proceed to describe it by drawings and passing specimens among you; then I will, tersely as possible, sum up its good points.

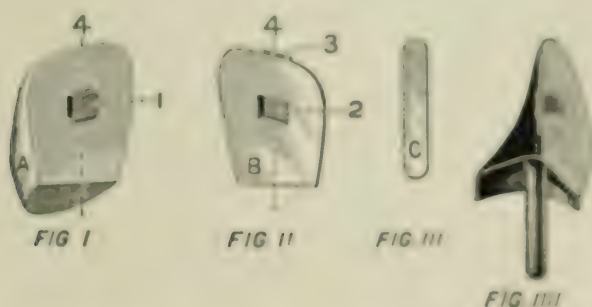
Fig. I. is a perspective view of the lingual surface of the facing A, which is provided with a flat, broad eye.

Fig. II. is a perspective view of the labial surface of the backing B, in which 2 is a socket for the reception of the eye 1 on Fig. I. when A and B are brought together; 3 in Fig. II. is a broad, thin bore, which connects with 1 and 2, into which the key C, Fig. III., wedges, thus firmly locking together A and B.

Fig. IIII. is a vertical section taken substantially on the lines 4, 4, in Figs. I. and II.

The comforts and advantages to be derived from using this device are enumerated as follows:

Extreme simplicity and speed in assembling, as the operator does not have to stop to make backings or care for porcelain in investments while soldering or annealing. Actual proximal contact of facings is secured, no dark shadows or gold being visible. This is impossible with soldered facings. The color of facings remains



as selected, because they never undergo the ill effects of investing and soldering. Strength of facing remains unimpaired, as it has been found that no matter how skilfully soldered facings are handled, they test out weaker than similar ones that have not been through the baneful process. Checking, visible or invisible, from soldering, is naturally impossible with this facing. As polishing and mounting crowns and bridges can be done with facings detached, there is little risk of accidental fracture.

Where gutta-percha or other heat materials are used for mounting crowns and bridges, especially open-faced caps, great comfort is obtained, for the reason that metal work is heated and mounted minus the facings, which are in no case liable to injury through heat and strains in mounting.

Sanitary union by wax or other weak insoluble material between facings and backings is secured; mechanical precision in contact of surface between facings and backings. This one point is a great advance over the usual rough way, even if duplex backings are resorted to; ease of repair in case of fractured facings. Fifteen minutes should be all that is necessary, as it only means the removal of eye on backing, removal of key, grinding in duplicate facing and reinserting key. Consider your patient's nerve and time as well as your own in a case of this kind. Compare this point with the old way.

Providing any facing is not satisfactory in color or for other reasons, at any stage of the proceedings, even after all is mounted, it is an easy matter to substitute a suitable one. In grinding facing and backing to conform to the case in hand, the parts remain in close unison, because of mechanical lock, and do not slide annoyingly one upon the other. Interchangeability is guaranteed.

With this device it is possible when desired to fashion occlusal and incisal protection extensions, and simply forming a nearly rectangular hole through the same for key, with a small fissure bur.

The last, but by no means smallest, point lies in the strength of the facings, which have been found by dynamometric tests to stand comparatively high. This virtue lies in the peculiar thin triangular form of the insert web, which is only twelve one-thousandths thick transversely, but extends longitudinally sufficiently far for strength. Facings are subjected to transverse fractures, and cross-pins usually occupy at least sixty one-thousandths space; even longitudinal pins take up thirty one-thousandths transverse room, whereas the rib in this tooth only weakens the tooth transversely by twelve one-thousandths.

LONGEVITY OF DENTISTS.¹

BY WALDO E. BOARDMAN, D.M.D., BOSTON, MASS.

IN casting about for material in the preparation of a paper, the writer was aware of the irksome task of finding something new and interesting. He has, however, selected the above-named topic, and, without elaboration, will endeavor to give some facts, which are new as far as he has been able to learn.

A great deal of discussion has been given in dental societies relative to the short life of dentists as a body, by reason of the physical and mental high pressure to which they are subjected; that their lives are imperilled to a greater extent than are those engaged in other professional careers; that they are overworked and labor in poorly ventilated quarters, irregular in their habits, inhale the breath of patients, and in the position at the chair are stooped, cramped, and strained, and often for hours maintain such posi-

¹ Read before the Harvard Odontological Society, December 7, 1899.

tions; that they labor too many hours, do not take the necessary recreation, too few if any vacations, etc,—all tending to nerve-strain, so frequently referred to in discussions of the questions pertaining to our calling.

We are subjected to the exacting duties above depicted, many lead sedentary and practically inactive lives, inhale fetid breaths and exhalations from the bodies of patients, some of whom may not be scrupulously neat and clean; others are weak and nervous and come to our chairs in fear and trembling, which adds to the burden put upon our nervous force.

The exacting duties of dentists have often called forth from my clientele remarks upon the unhealthy duties of our professional calling, and they have cited in support of their contention much of which has heretofore been mentioned. It is the general opinion of the laity that we, as professional men, are pursuing an unhealthy occupation.

It is not my purpose here to refute by argument what has been noted thus far, but rather to present facts bearing upon this subject for your consideration, and thought by the speaker to be quite conclusive that dentists, as a body, do live the average length of life allotted to those engaged in other professional pursuits. No doubt we labor under poor hygienic conditions comparable with the dignified callings of law, divinity, and medicine, for we are at all times in contact with varying classes of individuals under different degrees of hygienic ideas. After all, do not dentists in many instances live to a green old age? Many in and about Boston might be cited in support of our contention.

Several years ago the writer was delegated to prepare for publication a catalogue of past students of a professional school which covered a period of three decades, and in so doing he had not only to ascertain facts of those past living students, but of those who had died, and the causes of death. This set him to thinking upon this subject. Still further, he has made search through records of the past fifty years and gathered statistics of all recorded deaths of dentists given by the dental journals, and herewith presents part of the data obtained.

Many believe that consumption is the great destroyer, while others believe Bright's to be the chief disease.

Is the dental profession an unhealthy one? Do dentists live as long as those engaged in other professions, and do the following

facts warrant us in believing we are following an unhealthy occupation?

As far as I have been able to verify from the records of the past fifty years, the facts are found to be very different from what was anticipated, for it was supposed that consumption was practically the principle cause of dental mortality.

From the records of between five hundred and six hundred dentists who have died, I have the statistics of sixty-five diseases, eleven of them named below and divided as follows:

Heart disease, 53; consumption, 42; Bright's, 27; pneumonia, 21; typhoid fever, 20; paralysis, 19; accidents, 16; cerebral affections, 13; stomach diseases, 11; cancer, 5; suicides, 5; no disease given, 119. Total, 351.

Their ages ranged from twenty-two to one hundred years. Of one hundred and seventy-six dentists whose years of practice are known, I have figured as six thousand and twenty-nine, or an average of over thirty-four years in practice.

Table of number of deaths, showing average age by decades, and average age of the total:

Age.	Number of Deaths.	Total Age.	Average.
22-32	81	2,242	27.67+
33-43	63	2,435	38.65+
44-54	87	4,262	49.
55-65	110	6,555	59.13+
66-76	114	8,093	70.99+
77-87	52	4,182	80.42+
88-100	5	474	94.8
	<hr/> 512	<hr/>)28,243	

55.16 years.

As an addenda, let me quote from the statistics as given in 1892 relative to Great Britain,—viz., that the average life in Great Britain is nine years longer than fifty years ago.

Furthermore, I quote from a speech of Dr. J. Y. Crawford, delivered at the World's Columbian Dental Congress, in which he claimed that "modern dentistry has exerted greater potency than all others in bringing about this felicitous [longevity] result."

"No intelligent observer will deny that the great awakening of civilized men, particularly noticeable in the United States, as to the importance of preserving the natural teeth has, in the last

half-century, been a perceptible influence in bringing about the increased longevity alluded to, and that it will be still greater in the future."

This will also apply to dentists, for naturally their teeth are cared for as well as those of the laity.

In closing let me digress somewhat and call attention to the rapid discoveries in scientific research, which may well cause us to pause and give thought to almost the last act at the close of the nineteenth century, wherein for the first time we are confronted—through certain chemical experiments—by the "scientific discovery of the principle of life," which makes possible for man to create life by artificial means. And in this connection why not go further and believe with the Christian Scientist that the human species may be propagated, not necessarily by natural process, but by the simple one of *thinking*? And why may we not then discard the Brown-Séquard "elixir of life," and trust to the lengthening of our allotted span by chemical or other processes to be discovered? Surely, then, we will have reached the millennium.

ALLOYS FOR FILLING PURPOSES.¹

BY A. P. FELLOWS, D.D.S., PHILADELPHIA.

I HAVE brought together in this paper my experiences, ranging over a period of a dozen years, with the furnace and crucible and the alloys when ready for use, and shall only attempt to mention some of the things which modify the working qualities of amalgams.

What more fitting time than this to be truly professional in regard to the materials we use in our practice? We would not use or prescribe a medicine of which we did not know its component parts and its action. Why should we do differently with our alloys? Do we know the ingredients of the alloys we are using daily, and what their qualities are, and why those qualities are present or absent? If we do not, is it not time to begin? Is it not common

¹ Read before the Academy of Stomatology, January 23, 1900.

to buy an ounce of "amalgam" and use that for every tooth that requires amalgam, and when that quantity is used to buy another ounce of whatever alloy a friend recommends, not knowing or caring what the formula may be, or how it is made, or what qualities the alloy possesses? I say again, is it not time to begin to be professional, to use only such alloys as are accompanied by printed formulæ?

For many years we have been seeking a material for filling teeth which may be inserted in a plastic condition, requiring no great pressure in insertion, which will not injure the pulp or supporting walls; which will become hard enough after setting to stand the stress of mastication without changing its form, and neither shrink nor expand.

Years ago an amalgam of pure silver and mercury was tried, and at the present time silver is the base of all our dental alloys, varying percentages of other metals being combined with it to give peculiar qualities. The metals in general use besides silver are tin, gold, copper, zinc, platinum, and sometimes antimony, bismuth, cadmium, and other metals, named approximately in order of usefulness.

Tin added to the silver gives an alloy which amalgamates more readily and thoroughly than pure silver, and the amalgam sets more slowly, and is more stable and generally more workable. Gold adds edge-strength; also increases the speed of setting. Copper adds edge-strength, but reduces the speed of setting. Zinc reduces edge-strength and speed of setting, but also reduces the tendency to contract. Platinum is supposed to give hardness to an alloy, but it is of questionable utility. All the other metals have been discarded.

I have noticed that in proportion to the increase in the percentage of silver, there is an increase in the amount of mercury required, an increase in the difficulty of amalgamation, an increase in the hardness of the amalgam up to certain limits, and an increase in the speed of setting and also in the tendency to bulge or expand, and conversely as the percentage of silver is decreased there is an increase in the property of easy and thorough amalgamation, the alloy rubbing up more smoothly with the mercury either in the palm or in the mortar. We also find the amalgam slower setting and softer when set. The filling will not stand the strain of mastication as well, and will have less edge-strength. The

use of silver in our dental alloys varies from forty to seventy per cent.

Tin stands second in usefulness for dental alloys, and varies in its proportions from twenty-five to sixty per cent. Undoubtedly its greatest use is to facilitate amalgamation. It has therapeutic properties; it renders the filling less conducting, also softer, and gives a better and more stable color; but since it oxidizes readily, and the alloy in which it enters to any great extent is soft, its action should be controlled, and so we look for a metal which will counterbalance its action, which is gold.

Gold, therefore, takes third place in dental alloys, and ranges in proportion from a fraction of one per cent. to ten per cent. Gold gives certain properties peculiar to itself. Alone it has a great affinity for mercury, but as soon as it is alloyed with other metals it loses that affinity to some extent. I have not noticed a greater ease in amalgamation of an alloy containing gold than one not containing it. Indeed, it has always appeared to me, though I may be mistaken, that an alloy containing gold does not amalgamate as readily as the same where gold was absent. It does give more hardness to an alloy than an equal percentage of any other metal.

Gold controls color, in that it is not acted upon by any acid or by the atmosphere. It gives an excellent edge-strength, and also renders the alloy quick-setting, which at times may be put to good service, but I think that in general practice too rapidly setting alloys are not advisable, as there is a greater chance of shrinkage, and one does not have time for the proper packing which is so absolutely necessary in the making of a correct filling. No doubt all of us have seen fillings which did not conform to the inside surface of the cavity properly, though they appeared to be good from the outside. I think this is due in part to the use of too rapid setting alloys, also to use of too large pieces, etc.

Copper imparts much the same qualities that gold does, and it is a question whether it should not rank ahead of gold in the making of alloys. No metal we use is more stable, neither shrinking nor expanding. It permits easy and thorough amalgamation, and causes slowness of setting, thereby controlling the metals which produce more rapid setting. It imparts good edge-strength, no fillings retaining better edges than those containing a large percentage of copper. When in combination with gold, the tendency to tarnish is so reduced that one can not detect the presence

of copper by the color. I have fillings in which copper is present in good percentage, and in years of use there has been no tooth discoloration and but slight tarnish to the filling. I would venture to say that there are few alloys used in every-day practice which do not contain copper to a certain extent, though we may not be aware of it. We know that there is an alloy of copper, zinc, and platinum which will withstand the action of nitric acid, and no doubt gold gives this same property to an alloy containing copper.

Alloys containing zinc amalgamate quite readily, but not as smoothly as those largely tin. To the amalgam it gives whiteness, slowness of setting, and it controls shrinkage. An alloy containing zinc will not reach its full degree of hardness for a considerably greater time than the same alloy minus the zinc.

The other metals mentioned have been pretty generally discarded in the making of dental alloys, as their bad qualities overbalance the good ones. We cannot be too careful in the choice and handling of an alloy for filling, to get the advantage of useful qualities. One cannot amalgamate an alloy in the palm of the hand properly; if the alloy does amalgamate without pressure and grinding, it will probably make a soft amalgam. We are too apt to think "it is only an amalgam filling." Should we not use just as great pains with a filling of amalgam as with one of gold, since there are so many elements which vitiate the usefulness of the filling?

We should use the rubber dam, prepare the cavity, and insert the amalgam properly, after correctly choosing and mixing the alloy, and last, though not least, finish the filling as carefully as we would a gold filling. Other things being equal, I believe the filling will have no superior in so far as service and durability are concerned.

I have noticed that there are various things which will have a marked effect on the working of an alloy and the stability of the amalgam filling when finished. Chief among these are aging, oxidation, and quantity of mercury used, as well as the mode of mixing.

An alloy may be mixed with less mercury and more thoroughly in the mortar than in the palm, the resulting amalgam being harder when set and withstanding greater stress. In proportion to the decrease in the quantity of mercury the amalgam becomes harder, so long as thorough amalgamation has taken place. I have

also noticed that aging, or perhaps surface oxidation, renders the alloy more workable with less mercury, and that annealing while air is excluded will also give the same result with the addition of a less tendency to shrinkage.

Fresh cut alloys require too much mercury to get the degree of hardness which they should have, and they set altogether too rapidly.

In my experience in making alloys I have noticed that there is a great tendency on the part of nearly all the metals used to oxidize under the degree of heat necessary to thoroughly melt them; if the heat is not sufficiently intense the probabilities are that a portion of the silver or gold will remain in the bottom of the crucible, necessitating a remelt, and indicating that the ingot is not homogeneous.

To overcome this difficulty I have resorted to various devices, with varying success. I have covered the surface of the melts with various substances, to protect them from the air while being heated, in order to prevent oxidation so that the heat could be raised to a temperature sufficient to thoroughly melt all the metals and thoroughly mix them. I have also granulated the melt and remelted; also pulverized the melt and sifted and stirred till the mass of powder was thoroughly mixed, and then remelted, bringing the heat just high enough to melt, and then quickly casting in an ingot mould which was cold, in order that the melt might be quickly chilled and prevent the heavier metals from sinking to the bottom. This latter way has succeeded in giving a homogeneous alloy, and one with a loss of but six grains in ten ounces, part of which was accounted for.

If one will take a piece of iron, bring it to a white heat, and dip it into flowers of sulphur, it will at once melt, though the temperature will be considerably below the melting-point, showing the affinity that heated iron has for sulphur. The quality of the iron will be totally destroyed.

Would it not be reasonable to believe that other metals in a molten condition would have an affinity for the sulphur thrown off from the fuel in process of combustion, and that their qualities would be impaired in proportion to the amount of the vapors of sulphur present and taken up just as in the case of iron? May not other gases be present in the furnace which act readily on the melted metals to their detriment?

After an ingot has been made it is necessary to reduce it to very small particles, in order that the mercury can readily act upon it. This has been done by filing or turning, the one giving fine particles, the other thin flakes. We know an alloy will be taken up by mercury in proportion to the surface exposed; therefore the finer the powder the more readily it is amalgamated. If these sheets of turned or planed alloy were pulverized, or the ingot filed with a very fine file, and thus comminuted to dust-like fineness, I believe we could amalgamate it with more ease and with less mercury, producing therefore a harder amalgam.

SOME EFFECTS OF IMMIGRATION FROM A DENTAL VIEW.¹

BY FRANK R. DICKERMAN, D.M.D., TAUNTON, MASS.

At intervals we may see government statistics of the Bureau of Immigration, or extracts of them published in various forms; and we may well wonder that this country assimilates the new arrivals so readily and with so little trouble. If we are very much interested in such matters, we may even go to the trouble of hunting up literature on the subject; and we find an immense amount of rather dry reading; or, to put it another way, the interesting portion is such a small part of the whole, and is separated from the mass only with such great difficulty, that we drop the subject, saying to ourselves, "We pay taxes for some one to look after just such things as these; guess we'll let them earn their salaries."

Perhaps nearing election time we learn which candidate will have the votes of the Italio-American, Franco-American, or the German American Campaign Club, or a riot of striking coal-miners or some sweat-shop investigations again call our attention to the subject and we do more reading; but more commonly we learn through some one else that the population is more largely composed of foreign-born men and women, but just how many does not concern us very much. Not to burden you with figures, let us

¹ Read before the Harvard Odontological Society, September 28, 1899.

take Boston as a typical large city of the eastern district of the country. We find that in 1895 the percentage of foreign born to the total population was about thirty-six per cent.; those of foreign parentage to total population, about seventy-one per cent. Such a percentage would hardly prevail outside of the large cities except in certain localities almost exclusively settled by a certain class. These localities generally call for some special class of labor, and the products of this class of labor form almost the entire bulk of production of that locality. In a measure, these comers from other lands may be divided into two classes,—those who become citizens after a due lapse of time, and are probably in the majority, and those who do not care for the rights of citizenship for various reasons.

It has been stated that in proportion as these new-comers become citizens so much the more readily do they become assimilated; the racial lines are broken and set aside and a general broadening of that people occurs. Intermarriage of this class with outsiders, if we may call them such, is more common than with those who do not become citizens, always excepting those who are closely bound by some religious faith and by customs subservient to that faith. It seems to me that if one could follow out a line in this breaking down of racial distinction on the one hand, and the drawing closer and firmer on the other, some very interesting features would come to light.

Students have presented to us their views on heredity as concerns crime, pauperism, insanity, and various other matters, and it would seem that the laws that govern these things would also control the physical characteristics of a people. These characteristics would of course include the physical development of the jaws and teeth.

Those of us who are in the smaller cities and towns and who do more of a general practice than our city brethren may often note that the teeth of those who are foreign born and who have attained middle age or more in this country, present widely varying features. This difference ranges from one or two pin-head cavities in an otherwise almost perfect set of teeth to a most complete wreck of what was the same almost perfect set of teeth ten years, or even less, before. These teeth when good are usually short, thick, and of a yellow tint, the bicusps and molars are short, heavily covered with enamel, and nearly square in shape. The third

molar is fully developed, and occludes well with the upper molar. However, a very small cavity in these teeth causes much trouble from the extreme sensitiveness. Where one or two teeth are missing from such a set of teeth, the left inferior first molar is more apt to be the favorite; if another should be missing, the chances are more than good that it would be on the right side,—more often the upper second bicuspid or the first molar.

Then we have the same kind of teeth almost entirely destroyed by black or brown decay, attrition, and crumbling. In other cases the teeth are lost wholly from pyorrhœa alveolaris. This trouble generally winds up the career of the teeth of this class. Then we see those who have indifferently good teeth in their native country; cases where the white horn-like decay has reduced the teeth to a choice collection of roots and abscesses; this results from a five years' or less residence in this country, no sickness of importance or other contributing cause being known. This statement is upon the patients' authority, so there may be some slight contributing cause after all, but it is quite doubtful. In these cases which I have cited the employment, habits, manner of living, and pretty nearly the same diet were about the same as that of their native country.

Right here I would say that I do not wish to convey the idea that before these people came to this country they did not suffer with toothache and other kindred ailments, that all immigrants have good or even fair teeth, or that in their native country there were no bad teeth. People in those countries do have toothache and do have bad teeth,—in some cases, notoriously bad teeth. In order to watch the deterioration of a tooth, we ought to have a tooth to start with and to watch. Therefore I have made no account of the collections of roots and abscesses with which some of these people burden themselves.

Foreign-born children of foreign parentage coming to this country seem to suffer for a time more severely than their parents, but in the end apparently come out as well if not a little better. Coming here at the age when they are about to cut the permanent teeth, the temporary teeth suffer quite badly, crumbling away until not much is left but the roots. These roots are left in many times, and quietly go about their work of keeping space for the permanent teeth or favoring irregularities. The permanent set does not seem quite so good as that of the father, but still may be a good set of teeth. Possibly there may be required half a dozen fillings to

put them in good order, and the fillings, if properly done, remain in place for a long time.

Later the lower third molar will probably be lost either from crowding or bad texture. Such teeth are quite liable to decay, but there will be a large amount of decay, comparatively speaking, before discomfort is felt, and these teeth may remain in use several years longer than those of their parents.

American-born children of foreign parents are especial sufferers with the early decay of the temporary set. The teeth crumble and wear away to the gum line, and alveolar abscess steps in on the slightest provocation. Then, by forced premature extraction, crowding and irregularities may result. The lower first molars are not of much account in these cases, and are lost anywhere from the seventh to the tenth year, or just about early enough to let the second molars into the space, giving a fair grinding surface. Later the upper first molars and bicuspid may be lost.

A comparison of these two classes just mentioned—foreign-born children of foreign parentage and American-born children of foreign parentage—would show hardly any difference on the whole. If one suffers most at one time, the other seems to be in as much trouble later; so it is almost an even thing.

As a fitting illustration of the three types before mentioned, I will describe three sets of teeth, all of which I have seen within a year and a half. Their possessors also represent three generations,—grandfather, son, and granddaughter. The grandfather is a native of the Western Islands, about sixty-five years old, a carpenter by trade, and came to this country about twenty-eight years ago. He still has a complete set of teeth, in which I was able to find two small cavities only. In these cavities decay had evidently stopped some time ago. These cavities cause no discomfort. The teeth are quite well worn, and the gums have receded somewhat. An upper lateral was broken by an accident. With these exceptions, the teeth might be called perfect.

The son is about thirty-seven years old, carpenter by trade, and came to this country when about sixteen, to escape conscription for the military service required. His teeth seem to be about as good as the father's, but the bicuspid and molars are not quite so large. He has four fillings, mostly to the molars. The left lower first molar is missing.

The granddaughter is about eleven, and what few teeth of the

temporary set that are now left are about as bad as can be imagined. Those teeth of the permanent set which have come through are fairly good, strong teeth. Three of the first molars have small fillings in them. Just how these teeth will eventually turn out is, of course, wholly problematical, but now they bid fair to last her as long as she has any need of them, providing a reasonable amount of care be expended on them.

In a locality where a certain race of foreign-born people collect and settle permanently, because their special kind of labor is called for in that locality, we may find a type of jaws, teeth, and facial characteristics transmitted from generation to generation. These people seldom marry outside of their race, and in many cases keep to the customs and habits of their native land, unless the police and health officers interfere. These customs and habits have a direct influence on the mental and physical welfare of such people.

Again, in a locality where the population has a lesser percentage of foreign-born parents, but still a respectable percentage of the whole, we shall still expect to find a certain type of jaws and teeth and other characteristics peculiar to that people. In their descendants are found that same type, or traces of that type modified more or less by intermarriage and environment. In the one case the type tends to be perpetuated; in the other it seems to merge into another distinct type. So this merging-into-something-else process may go on until at some time in the far future there will be found a certain composite, which some very learned person will designate as the American jaw, the American teeth; perhaps he will go farther and add the American face.

Possibly this American face will have something of the "white man's burden" in it, possibly not. That will remain to be seen.

THE NEWNESS OF DENTISTRY.¹BY CHARLES W. ELIOT, LL.D.²

MR. PRESIDENT AND GENTLEMEN,—The coming together of these two societies is interesting to me, because I find the same sort of thing going on all over the country, in all branches of education, and in all the professions, scientific and learned. It is a new phenomenon, this rapid formation of sympathetic and co-operative societies. I have seen it within ten days in a new departure among the American universities. In Chicago, delegates from fourteen universities decided that they would begin the establishment of an Association of American Universities. We have never had such a thing before. We do not know exactly what will come out of it; but we are sure, those of us who took part in this beginning, that we shall gain through the co-operation of American universities an influence which the separate institutions would never have been able to exert. Just so, in the various recent societies which have been formed in this country in each of the learned and scientific professions, the co-operation of men of the same calling in different parts of the country, through societies which have common objects though perhaps different local problems, is, I believe, a new sign of progress.

The President has indicated the subject to which my name is attached in the programme, "The Newness of Dentistry." It is, I believe, the newest of the callings which require a high degree of knowledge and technical skill. It has taken advantage in the most rapid way of many of the most recent discoveries in chemistry, physiology, physics, and mechanical engineering. It has taken advantage of many of the interesting novelties in metallurgy and in the application of different combinations of metals. It has profited by the innumerable inventions and discoveries into which India rubber and gutta-percha enter. The laboratory of a dental practitioner to-day seems to me to be an epitome of applied chemistry, physiology, bacteriology, metallurgy, engineering, and physics, to which we must add the latest improvements in surgery. I need

¹ Read before the union meeting of The New York Institute of Stomatology and the American Academy of Dental Science, Boston, March 27, 1900.

² President of Harvard University.

but to enumerate these topics to show, in the first place, what a wide range of knowledge a dentist needs; secondly, what various skill he needs; and, thirdly, how new almost all his means and methods must be, because these sciences on which he relies are new to the world. A dentist, then, is a pioneer in the application of science; and he is a pioneer in a large region, because he relies upon the exact physical sciences quite as much as upon the sciences which are grouped under the general name of Natural History. He has a great field.

I remember, when the Dental School was first organized in Harvard University, that some of the advisers of the Corporation said, "Dentistry is too small a subject for a real profession,—it only deals with the mouth. It has too small a field for a university school." Fortunately, this somewhat narrow doctrine did not prevail, but it was warmly maintained in the discussion which preceded the foundation of our Dental School. It never seemed to me to be well founded. When we imagine treating with success any part of the human body, do we not invariably find it difficult to define the limits of the knowledge and skill which may be useful in that treatment? The specialists of the body, the specialists of any part of the body, need to be thoroughly informed men. If they are not, they cannot have the highest success in their specialties. It must be so in dentistry; yet it must be confessed that this is a comparatively new view of dentistry. Here again we have one of the aspects in which dentistry is a new profession.

In one respect our country has failed in its treatment of the dental profession. The dental schools taken together have not insisted upon a good education before the professional training was entered upon. This defect of dental education in our country is, I believe, due to a too limited view of the function of the dentist after he has entered upon his profession. I should be glad to think that these two societies would contribute to remedy this evil. I have been much impressed, during the striking development of the medical profession within the last thirty years in this country, with the great importance of the combined sentiment of medical men towards the reform and improvement of their profession; and I believe that a similar influence can be relied on for the improvement of the profession of dentistry. We can rely upon the dentists' interest in their calling to elevate the standard of the preliminary education for the profession.

The confidence of the community in the profession, and particularly the interest of the medical profession in the calling of the dentist, would, I think, be promoted if the dental profession as a whole entered more than it does into the problems of medical investigation. The dentist seems to me to have some remarkable facilities for contributing to the progress of preventive medicine. I remember that forty-five years ago or thereabouts, being in Richmond, Va., one day, I went into the slave market, curious, as a Northerner might naturally be, to see how men, women, and children were bought and sold; and I watched the auction for an hour or more. The first thing that struck me was the reliance placed by the purchasers upon the examination of the teeth. Everybody who is buying a horse or a dog looks at the teeth, partly for the determination of age, but also to determine the probable constitution and vigor. That is just what the buyers did to human beings in the Richmond slave market. Now, a dentist who practises for forty years sees, or may see, three generations of the same family; and if it were the habit of the profession to record the facts about the teeth of these generations, and the evidence the teeth give concerning diet and health habits, should we not learn something valuable about diet and the effects of different diets upon the constitution of the human creature? Surely we desperately need information on that subject.

My attention was drawn to this subject many years later, when I became pretty well acquainted with the population of the coast of Maine. I used to go yachting along that coast every summer; and the pleasure of yachting is being in with the land. The ocean is all very well; but one wants to go into harbor every night to have a quiet anchorage and see a new place. Therefore, I visited the villages all along the coast and up the rivers; and I was very much struck with the bad condition of the teeth of the young people. The generation preceding had very good teeth. If the slave market had prevailed along the coast of Maine in the last twenty-five years, the purchasers would have had very great difficulty in determining the value of the young men and women put up for sale; for their teeth were gone. What was the cause of this ruin? I believe it rested entirely upon the change in the diet of the population which resulted from the importation into Maine of fine white flour,—the finest possible white wheat flour was what the native bought, and he added to that sugar and what he called sauce, and, with

doughnuts and sweet cakes, these were his staple foods. Now, it did not take more than twenty or twenty-five years of this diet to change the teeth of the population very much for the worse. The previous generation used the wheat raised on their own farms and ground at the neighboring mill; and so they ate the whole wheat. I mention this simply to illustrate what I believe would be the very valuable contribution which dentists might make to our knowledge of the safe diet for a population become largely urban. I think we ought to hope to receive from the dental profession as a whole important contributions to medical research, and to our knowledge of the human body in health, and of the conditions under which health may be preserved.

The dental profession uses many new materials, new methods, and new powers, and I think may justly be described as new within a hundred years, perhaps within fifty years; but sometimes I think everything has been made new within the century now drawing to its close. A Chicago man was telling me the other day, when I mentioned certain slightly barbaric features of the city, that a few leading citizens had had to create everything in Chicago within the last fifty years. Fifty years ago it was nothing but a mud-hole, and now it was a great city; and a comparatively small number of men had created all the institutions of the place. I asked him if he supposed that Boston differed from Chicago in that respect. He said he did; but I replied, "There is not a thing in Boston that has not been made over root and branch within forty years; our water supply, our sewerage system, all our means of heating and lighting, and all our methods of transportation,—everything has been made over in the city of Boston." If you look abroad over the country, and see the condition of our government, of our schools and colleges, of our public institutions, our hospitals, libraries, and churches, they are either new or have been made over. The extreme novelty of all the grave problems that press upon our communities is, I believe, the fundamental reason why we have such great difficulty in dealing with them.

One of the great changes in the last twenty years is the rush of our populations into cities and towns. That is a change that has affected strongly the practice of dentistry. Dentistry is an art for an urban population, and our population becomes more and more urban. It is an art that is exercised chiefly for the benefit of the well-to-do, though we are all happy to see that the long-established

usage of the medical profession, the giving of a large portion of the time of medical men to gratuitous practice, is taking a strong hold among dentists.

If, then, the dental profession is new, it shares this quality with almost all other human interests. I look forward with confidence to rapid and important progress in the profession which you represent here so honorably. Indeed, I have personally seen such rapid advance, so many new fields conquered within the last thirty years, that I should be faithless, indeed, if I did not anticipate with confidence a vigorous development in the future.

THE UNION OF DENTAL AND MEDICAL SCHOOLS¹

BY DR. C. S. MINOT, BOSTON, MASS.²

MR. PRESIDENT AND GENTLEMEN,—Being a Bostonian, I am always coming to the Common, and I am struck with the sandwich man. These gentlemen, as you know, have going before them and coming behind them parts in which the public is supposed to be interested, and which are worthy of your attention. The man himself is worthy of no consideration whatever, and I feel to-night as a sort of a sandwich man. Those who came before me you have attended to, and those who come after me you should attend to. I am the sandwich man.

One speaker to-night seems to have omitted something I expected him to say,—that is, my honorable friend, the Speaker of the House, Mr. Myers, who privately informed me that he regarded the Democratic party as a case of caries on the tooth of time. I have been fortunate in my situation in one respect, in that I receive confidences. I am merely the sandwich or middle man. My neighbor on my right has informed me that he is the end man, and that he will make all the good jokes of the evening. You need not, therefore, expect me to be anything but serious and uninteresting.

¹ Read before the union meeting of The New York Institute of Stomatology and the American Academy of Dental Science, Boston, March 21, 1900.

² Professor in Harvard Medical School.

I am very glad personally that President Eliot has found it necessary to withdraw from our meeting, because that gives me more freedom than I would otherwise have felt in speaking of his contribution to the welfare of the dental profession. It seems to me there is no man to whom the dental profession is in greater debt than to President Eliot. It was to his initiative that was due the foundation of the Harvard Dental School, and he has followed up his interest in it, and he alone is responsible for the first suggestion of the change which leads to the topic upon which I have the honor to speak, the consolidation of, and the establishment of intimate relations between, our Dental Schools and our Medical Schools.

I cannot go along any of our streets in Boston without seeing here and there those curious square posts wound around with stripes of black and white. They recall the history of the application of mechanical treatment to human suffering. Every barber's pole is a record held up, for every passer-by to see, that surgery, one of the most important and dignified branches of medicine, started in a most humble fashion. It was a mere collateral occupation of the barber, and from that humble, unpromising beginning the surgical work of the profession has risen to the wonderful dignity of to-day. These facts must give much encouragement to the members of the dental profession. The dentists, like the surgeons, started as people who applied a mechanical treatment to the human body, and I believe that as the surgeon has risen to a recognized position as a person of the highest attainments, worthy to rank side by side with the men of the greatest learning of any profession, so too the dentist should rise from the beginning as a mechanical practitioner to one who is completely a member of the medical profession. I think hardly too much can be urged in this way, because the gain which stands before us is so very great. If we can bring up the dental profession to that point in which it shall take its legitimate position, we shall have done a very great service indeed. Dentistry, viewed in its proper light, is not something which is mere mechanics. Every dentist here, I believe, shares with me the conviction that dentistry should be something more scientific, more learned, than the mere mechanical treatment of caries of the teeth. It is a profession which requires a great deal of scientific knowledge. I hold it to be no criticism of the dental profession that those of us who stand to-day as the teachers were inadequately trained.

We did not have the opportunities, the knowledge did not exist, teachers could not, therefore, give it to us. We live in an age in which knowledge has been constantly added to, and it is a part of our duty, as it seems to me, to add to the range and fulness of the instruction which shall lead to the development of the accomplished dentist of the future. No profession which stands upon its present basis, and which does not go beyond that basis, can ever hope to rise beyond a dead level of monotonous and deathlike repetition of what has been before. We must do something better. As a naturalist I think as a naturalist, therefore I think always that evolution, progress, the going on to something higher and better than that which has ever been, is the very condition of existence, and I believe that the medical profession has gained its high position in society and that it has gone ahead for this reason, and I believe the dental profession is gaining more and more, day by day, because it too is developing a broader stand-point; it too is learning to take the scientific view of the responsibilities of each individual practitioner. The dentist can no longer be a mere mechanic. It is, I believe, the part of those who are engaged with the dental schools to contribute to the advancement of dental education.

It seems to me that perhaps the greatest of the services which President Eliot has rendered the dental school is the bringing about the union, as it is now accomplished at Harvard, of the Dental, the Medical, and the Veterinary Schools. One of the first results has been to raise the standard of entrance to the Harvard Dental School. The next great change to be required is chemistry as a condition of entrance to the school. Certainly that can have but one result,—the ultimate raising of the standard of that school until it is as high as in the highest medical school. Then, I think, will come about the amalgamation of these two things. I am convinced that the dental profession will soon be merged absolutely, without demarcation, into the medical profession, perhaps not in one individual's lifetime, but in a short time as measured in the history of civilization and the development of a nation. That means, perhaps, not in ten years or fifteen years, but in some longer period. If we can accomplish it in ten or fifteen years, so much the better for all concerned. When this result comes about, it seems to me there is but one way in which the dental profession can take its proper place in relation to medicine. We know now there are ophthalmology, obstetrics, and gynecology, and so on through

many subjects, making altogether a long list of specialties in medicine. The very growth of medicine contributes to the recognition and importance of specialties. It becomes us now to offer to the students studies which shall be adapted to the special trend of their intellects. Students can now enter some of our medical schools, and if they feel an inclination to special subjects, pursue those alone. They can turn to ophthalmology, obstetrics, or gynecology, as the case may be. Why not then recognize that the general medical training which gives a knowledge of the general principles of the maintenance of health is as applicable to the practice of dentistry as to that of ophthalmology or obstetrics or gynecology. Would not that change, the full recognition of that stand-point, place the dental profession in its proper position in regard to the medical profession? It seems to me the change which President Eliot has brought to a fulfilment at Harvard must tend to that one ultimate condition, the incorporation of the dental school in the medical school. Dentistry would then be a specialty in medicine, and such it should become, and I believe that that change in the relation of the dental to the medical profession would redound to the interests of both. I could enlarge very much on this subject, because it is one that has occupied my attention. I would like to add, that when the proposition to unite the two schools was brought forward by President Eliot it seemed to me unwise and unpractical, but a more thoughtful examination of the reasons advanced by him in favor of such a consolidation convinced me that his position was reasonable, and I believe that President Eliot in advocating, and through his personal influence accomplishing, the actual consolidation of the Dental and Medical Schools of Harvard University has made a very great contribution to the welfare of the medical profession, and a contribution, it seems to me, equally great to the welfare of the dental profession. I hold that the benefit is mutual, that the union of these two schools will help each of them, and for that reason I believe that we should all recognize with gratitude the services which President Eliot has rendered to the Dental and the Medical Schools by the change which he has initiated at Harvard.

I feel great sympathy with you, gentlemen, in having to listen to my remarks. I disclaim entirely all responsibility for them. You ought to have had a wiser man, a wittier speaker, a more profound thinker, to address you this evening, because it is a rare

occasion. The whole onus of the fault of calling me up should rest upon the shoulders of Professor Brackett, and I ask you, therefore, to bestow your disapprobation upon him alone, and I further ask both him and you to accept my thanks for your great courtesy and your generous hospitality.

THE HAND THE SERVANT OF THE BRAIN.¹

BY DR. E. A. BOGUE, NEW YORK.

MR. PRESIDENT AND GENTLEMEN,—By making the hand serve the brain, manufacturing nations have uniformly come to the front.

In the fifteenth and sixteenth centuries Spain was the most powerful nation in Europe, and at that time the strongest in her manufactures, but she came to rely upon the force of arms for her supremacy, and adopted the Roman idea that it was demeaning to work with the hands. She discouraged handiwork and drove the Moors, her Mohammedan workers, out of her borders, while her better classes entered the army and the church. Her position to-day is known of all men; it is not magnanimous to dwell upon it. England and the Anglo-Saxon races have encouraged manufactures until the disseminated products of their handiwork may be found in the uttermost corners of the habitable globe. When, finally, the American idea was found at Versailles by the German conquerors after the victory at Sedan, Germany speedily set about organizing another victory, and this time it was an industrial one, the proof of which we see every time we read the legend, "Made in Germany."

Turning now to our own calling, we remark that in France the first steps were taken to make of us a distinct profession between the years 1306 and 1311, for it was then that the separation took place between the doctors and the barbers practising surgery, including tooth-pulling.

The beginning of so-called American dentistry was in 1775 or 1776, when Mr. Robert Woffendale, educated as a dentist by Thomas

¹ Read before the union meeting of The New York Institute of Stomatology and the American Academy of Dental Science, Boston, March 21, 1900.

Bardmore, dentist to George III., arrived in America, so that the first American dentist was an Englishman.

Among the first who followed him was Joseph Lemaire, a French dentist; then Dr. James Gardette, another Frenchman, and then Isaac Greenwood, another Englishman, who took up his residence in Boston and made teeth for the first President of the United States, and though he did not receive the public appointment of dentist to the President, he yet became and has remained celebrated because of it.

The first dental college was chartered at Baltimore in 1839, and held its first session in 1840. From that time to this the history of American dentistry has been a history of the adaptation of means to ends, a history of constant inventions and their application in actual practice. The most distinguished men practising dentistry as a specialty have not been, as a rule, men who were graduated in medicine and failing in that took up dentistry, but men whose fingers had been taught an art the limits of which they had perceived as they undertook to practise it, and those limits had proved an incentive to further and continued efforts.

For many years the American mode of practice was either more conservative or more successful than others, for the American dentist did not hesitate to work with his hands. As a result, the American dentist abroad was sought after by those classes in society having both intelligence and money. The American dentist has not been tramelled either by the traditions of society, for he had not any, or of the medical school, for he did not graduate there, nor yet by an *esprit-de-corps*, for the "corps" did not exist, but as he had been brought up by hand to encounter difficulties and to conquer them with his hands and his head, he went right on in that same way in his chosen profession.

When he found that his calling was dignified because it was exercised upon the human body, he straightway betook him to the medical school that he might get additional knowledge.

The question, therefore, is upon us to-day, What is the best method of training a dental surgeon for his peculiar work?

Our professional colleagues in France and England have adopted different ways. France began by establishing technical schools, and had reached a point of respectable success in her teachings when a class of men who called themselves physicians of the mouth ("*médecins de la bouche*") and were graduates in medicine succeeded in

having such laws passed that no one could thenceforward practise dentistry in France without being submitted to an examination. The examining boards established by this law are composed of medical men. Almost immediately practical work in these French schools fell off. Instead of seeking to acquire sufficient technical skill to enable them to perform ordinary dental operations, the students set to work to acquire enough theoretical knowledge to answer the questions propounded by the medical men on the boards of examination. The clinics dwindled, and the skill of the candidates also. This comes from putting theory first and practice afterwards.

Our English friends began by admitting into the College of Surgeons dental students who were able to pass the preliminary examinations. These students went through portions of the same course as that taken by the general surgeon, with divergence enough to allow them to acquire such knowledge in the dental hospital as would enable them to pass as licentiates of dental surgery, or, if they wished to rank well, and could spend the necessary time and money, they graduated as surgeons and gained the L.D.S. besides. Many of the better ones from among these students came to America to acquire the manipulative skill that they could not procure at home, until finally England passed her dental law, which resulted in keeping most of them in the home schools. It has seemed to me that the criticism of Herbert Spencer upon certain examination papers once sent to him would be very applicable to the examinations, not only of the English and French examining boards, but at the present time very largely to our own as well,—viz., "They are drawn up with the exclusive view of testing *acquisition* rather than *power*. . . . The more important thing to be ascertained is not the quantity of knowledge which a man has taken in, but the ability he shows to use the knowledge he has acquired."

In the February number of the INTERNATIONAL DENTAL JOURNAL an editorial article advocates the addition of a fourth year to the course of instruction for a dentist, and adds: "It is either four years or a reduction in the curriculum. It must be evident to all experienced teachers that we are graduating men of partial culture in many things and experts in nothing. The practical branches are suffering as never before, and this in spite of the time devoted to technical work."

Two distinguished members of the dental hospital of the Lon-

don Medical School were to have been with us this evening. They inform me that after great efforts a few of the more earnest ones among them have succeeded in establishing, in addition to the theoretical instruction heretofore given, a more extended technical training in the dental hospital to which they are attached than has heretofore been attainable in England except by private tuition, so that now the English student may take his technical training with his theoretical, as the French student formerly could. What, then, considering the steps along which we have come, is the surest way to obtain a profound theoretical and practical knowledge of our calling? We are taught by the successes of American dentistry as well as by the acknowledged shortcomings in the teachings of the other nations.

It is not generally recognized that man has several ways of expressing himself, and that sculpture, architecture, and finger craft, directed by a qualified and instructed brain, are more durable forms of expression and often more productive of good results than oral speech.

He who can do a useful thing well takes delight in the doing, and he who has joy in the doing is sure to be doing well and is going on towards perfection.

How many students are gradated from our literary and professional colleges who have no means of pronouncing themselves? How many have their heads full of knowledge, but are unable to turn their hands to a single useful thing?

The cowboy graduates of Oxford and Cambridge, whom I have seen, and of Yale and Harvard, of whom I have heard, give evidence of the hiatus in our educational methods.

The feeling of strong mental powers, but of expressional helplessness, which oppresses young men just out of college would vanish if manual training had taught them how to express themselves with their hands. Manual training properly defined would result in the development of the understanding and expressing man.

I advocate, therefore, the continuation of manual training from the kindergarten to the doctor's degree, confident that, in whatever calling a man may engage, success consists in being useful to somebody else than himself. The purely selfish man will not succeed.

He who receives a suffering patient with the mental question, "How much is there in it for me?" will never acquire manual dexterity, though he may succeed in writing a page as illegibly as

Choate himself. He will never become a great surgeon. He will never rank among the best oral surgeons.

We should commence our professional education by training the hand. We should teach the art, and with it the science which underlies that art, which enlightens the mind that practises it and guides the hand that accomplishes it, and as the mind opens more and more to comprehend the work that is being done, it will seek ways out of the difficulties that beset us in our daily work by endeavoring to understand more thoroughly the physical laws governing the tissues with which we have to deal.

Professor Eggleston was unquestionably right when he insisted in the foundation of the Columbia University School of Mines that the best channel by which the mind could be enlarged and enlightened and become able to direct its servant,—the hand,—was through manual training and the complementary studies that necessarily accompany it.

In insisting upon such professional training for practitioners of our specialty, I do not wish to forget the remarks of Professor Blackie, of the University of Edinburgh, who says, "The merely professional man is always a narrow man. . . . In society the most accomplished man of mere professional skill is often a nullity; he has sunk his humanity in his dexterity. He is a leather dealer, and can talk only about leather; a student, and smells fustily of books, as an inveterate smoker does of tobacco. . . . The most exact professional drill will omit to teach him the most interesting and the most important part of his own business,—that part, namely, where the specialty of the profession comes directly into contact with the generality of human notions and human sympathies. The best preservatives against the cramping force of merely professional study are the healthy influences of society, travel, and a familiarity with great writers,—especially poets and historians,—whose thoughts 'make rich the blood of the world' and enlarge the platform of sympathetic intelligence."

We have now upon our side the recent action of the German Emperor, who has given to the three Prussian High Schools of Technology of Berlin, Aix-la-Chapelle, and Dortmund the right of conferring the degree of "Doctor Ingenieur," so that the young engineer, chemist, or architect may now have the title which in Germany is of so much value both in a professional and social sense.

This gives an added dignity to technical training, and is an acknowledgment from a pretty high authority of the value of those men who can do something with their hands.

DENTAL SERVICE AS A MINISTRY TO LIFE.¹

BY REV. DR. GEORGE A. GORDON.²

MR. PRESIDENT AND GENTLEMEN,—I believe that I am responsible for the breadth of this subject, and this was my idea in suggesting it: I heard of a preacher who was in the habit of taking a whole chapter from which to preach his sermon, and when he was questioned why, he said he wanted plenty of room, because if he was persecuted in one text he could flee to another, and I thought there might be some aspect of this subject to which I could flee.

I met a dental epitaph recently which I think will interest you:

“Here lies the body of Robert Gordon,
With mouth almighty and teeth accord’n,
Stranger, walk lightly over this wonder,
For if he opens his mouth you’re gone, by thunder.”

Now, this brings to my mind a fact. When Matthew Arnold came to this country to lecture he found that he could not speak. The lamented Professor Churchill, prince among elocutionists, was sent for to see what could be done with him. He said that he found that Mr. Arnold had a very sweet voice naturally, but instead of teeth he had a mouthful of bones. Now, there is one problem suggested by your profession,—What might have been done with Matthew Arnold, and what might be done with others like him?

Several references have been made to the newness of your profession, and the address of President Eliot was upon that theme. It is exceedingly strange that your profession should be new.

¹ Read before the union meeting of The New York Institute of Stomatology and the American Academy of Dental Science, Boston, March 21, 1900.

² Pastor of the Old South Church.

John Stuart Mill says that theoretic inquiry is stimulated by practical interest. All science has its origin in practical interest; an urgent practical interest is sufficient to organize a new science.

Now I have never had any experience of the pain whatever, but my friends have told me that the toothache is an urgent practical interest, and it is more than strange that this immemorial, pungent interest has been so late in organizing a scientific profession to deal with it. It is a fact, however, and how can we account for it? I think it can be accounted for by another fact, namely, that the pain of toothache has been made light of among almost all peoples. You remember what Robert Burns says in his "Address to the Toothache:"

"When fevers burn, or ague freezes,
Rheumatics gnaw, or cholic squeezes;
Our neighbor's sympathy may ease us
Wi' pitying moan;
But thee—thou hell o' a' diseases,
Aye mocks our groan!"

That statement corresponds to the general experience of mankind. Burns says still more in that remarkable poem. I do not think there is anything like it in all literature. It shows the humanity of the man. He belongs to your brotherhood. He indicates the terrible nature of the pain in several other stanzas. He says:

"Where'er that place be priests ca' hell,
Whence a' the tones o' mis'ry yell,
And ranked plagues their numbers tell,
In dreadfu' raw,
Thou, Toothache, surely bear'st the bell
Among them a'!"

Then he has an address to his friend the devil, to whom he talks in a jocosé way:

"O thou grim mischief-making child,
That gars the notes of discord squeel,
Till daft mankind aft dance a reel
In gore a shoe-thick,—
Gie a' the faes o' Scotland's weal
A towmand's Tooth-ache!"

That is an imprecation equal to any of the Hebrew psalms.

I have indicated one reason for the recency of your profession. People did not care when their neighbors had the toothache; it

was only toothache. And then, deeper than that, ignorance. They did not know that pain is a life-killer,—pain of any sort, whether it kills at once or not. Pain disintegrates the organism, it is the enemy of life. And, still further, they did not know, as we all know, that the function of the teeth is most intimately connected with health and life, and it is this immemorial ignorance and want of sympathy that account for the comparative newness of your profession. Men know better now, and they have keener and more humane sympathies, and out of these two facts, stimulated by the great scientific processes of the century bringing exact knowledge to the benefit of life everywhere, has come your profession.

President Eliot suggested to me a remark of Dr. Holmes, that theologians would have modified their views of eschatology if they had constructed their doctrine of future punishment while they were having an attack of toothache. It would be like the story that Tennyson tells of the furnace-tender who went to church and heard a terrific sermon on everlasting torment in hell fire. His wife, a sensitive, conscientious woman, feeling the rebuke of the ideal upon her spirit, feeling, as the best spirits always do, how immeasurably below their ideal they live, almost lost her reason through imagination of the torment which was probably to be hers. The furnace-tender said to her, "My dear, cheer up; 'tain't true, 'tain't true; no constitution could stand it." And it is well to take all doctrines of speculation into the vivid, instructed humane consciousness of man, and make them tell their story there, and receive such revision as will send them out upon a new mission.

President Eliot was perfectly right in speaking of the entire newness which has come over the world when he alluded to the churches. Everything is new. The fact is, wherever you find a stationary interest, there you find a decaying interest. Wherever the interest is being pushed into commanding power and influence, there is novelty, there is renewal; and wherever this note is absent, there is retrogression.

I looked at the titles of these two societies,—the mouth, teeth, stomach, and the soul,—and I thought that the dreadful thing would be not to have a congregation with teeth, but to have one without teeth. What could you do with such a congregation? Bad digestion, eternal dyspepsia; could it issue in anything other

than unhappy, pessimistic souls, impatient, impossible? President Eliot never could get a dollar for the support of the University out of such a constituency as that. Teeth are tremendous; the want of teeth still more tremendous.

I had expected that much would be said about the influence of your profession in making human life attractive. Your profession is a fine art. The fact is, everything is beautiful that is wholesome, clean, healthy, entire, and the finest features in the world are absolutely spoiled by a toothless mouth; and as a great deal of good fellowship depends upon the attractiveness of human beings to human beings, I look for a ministry to life from your profession, not simply in the cases of disease and loss, but still more in taking the children in hand and making their teeth strong and lasting as existence.

I was born in Scotland, and notwithstanding the fact that Burns wrote a poem on the toothache, there was very little toothache there then; there was very little of it until the new diet was introduced to which President Eliot referred. Toothache was never heard of in the family in which I was born. I do not think I had a dentist look into my mouth until I was thirty-five years old. No need of it. Now, if the dental profession could abolish itself in this way, what a tremendous service it would render. That is what we are all aiming at. The time is coming when there will be no need of my profession. Holiness written on the harnesses of the horses, a city without a church. Boston is, however, still a good way off from that. And a good way off from the necessary abolition of your profession.

Seriously, we speak of the coming man and the coming woman, and we speak of the coming human being, and he is our supreme interest, and every serious worker in every high profession must occasionally lift up his eyes unto that hill whence cometh his inspiration. It is a great inspiration to think that by righteous living, by honorable and skilful service and beneficent work, something may be done to improve the quality of the human race in every respect, and it seems to me that this your profession, through generations of service, enlarging science, and growing skill, may contribute to that coming man; not in one aspect of his life alone, but through health and integrity and attractiveness and happiness, to the very highest element in manhood, character, and spirit.

DENTISTRY IN ITS RELATION TO MEDICINE.¹

BY DR. GEORGE S. ALLAN, NEW YORK.

MR. PRESIDENT AND GENTLEMEN,—There are two topics, near to my heart and closely related, that I wished to hear mentioned: First, the enactment of laws compelling dentists to graduate as M.D.'s; second, the purification of our literature from trade influences. I regret that they have received so little attention.

A word in reference to the toast to which President Eliot so ably and thoughtfully responded. My respect for President Eliot and appreciation of the good work he has done in our cause is surpassed by no one here present. So, though you may, and quite likely will, question my judgment, you may not doubt my sincerity. But the wording of the toast strikes me unpleasantly,—“The Newness of Dentistry.” Dentistry is not a new calling. History, ancient and modern, is full of references to it, quite as much so as to medicine in general.

Dentistry as a science, an art, or a profession has certainly rapidly advanced in late years. So has medicine. So has every specialty in medicine. All have shown a quickened life, a rapid advancement, and in about equal degrees. Dentistry is as old as the time when man had a body, and that body was subject to troubles, diseases, and torments. When Medicine(?) took the helm and said that she would attempt to alleviate these pains and sufferings, she did not say that she was going to take charge of one part of the body and not another part; that one part could be neglected and another part have close attention paid to it. The body and all that pertains to it, the mouth and the organs within it, are a most essential part of this connected whole. To be sure, dentistry occupies very peculiar relations to medicine in that its life and growth have not been connected with the parent profession. Dentistry is just as much a part of medicine as any other specialty; therefore I do not like the title, “Dentistry is New.” Dentistry is simply seeking its rights. It wants to go where it belongs as an integral part of the medical profession, and never will it be properly represented until it is recognized as such the

¹ Read before the union meeting of The New York Institute of Stomatology and the American Academy of Dental Science, Boston, March 21, 1900.

world over. I know it is difficult to amalgamate it. It commenced its course outside of the medical profession, and it is now seeking its proper position. Medical schools did not incorporate it as a part of their curriculum. They did not teach the dental art, the dental science; they did not lay stress upon the dental organs, the organs of the mouth and all that relates to them. It is a most absurd thought that it can stand alone. To proclaim this idea is to state its impossibility. Dentists must have a thorough knowledge of medicine, and just as thorough a knowledge of medicine as general practitioners or those devoted to any other specialty. So when I hear this sort of talk, that we are a profession of ourselves, it angers me; it is not so.

I would like very much to have heard something said to-night on how to bring about that amalgamation of dental instruction with the instruction that is given to those who intend to practise medicine as a whole. I know a great many of my brethren who insist upon a separate dental college. I hold that this is radically wrong. The dental practitioner must start in to take his medical course and branch off when the proper time comes to take his specialty. I do not know how it is to be done, but it seems to me the proper way to go to work is to insist upon the medical colleges in their course of instruction giving special courses; in other words, the man who is to practise any specialty in medicine should be obliged to take the medical course as a whole for one, two, or three years, and then to have special instruction in whatever branches he chooses to take up. I do not know of any other way in which it can be done, but that the day will come when that, or some other equally practical course, will be adopted, I have no doubt.

We have had a most enjoyable and instructive evening. When you gentlemen come to New York I have not the slightest doubt but that all the members of the Institute will extend you a most cordial reception, and if we do not give you as good a time as you have given us, it will not be the fault of our intentions, it will be because we cannot do it, that New York does not afford the opportunities.

Reports of Society Meetings.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology was held on the evening of January 23, 1900, at the rooms of the Academy, 1731 Chestnut Street, Philadelphia, Professor E. T. Darby, President *pro tem.*, in the chair.

A paper entitled "Alloys for Filling Purposes" was read by Dr. A. P. Fellows, of Philadelphia.

(For Dr. Fellows's paper, see page 379.)

DISCUSSION.

Dr. Rice.—I have a clipping from the *Dental Brief*, by Dr. Bogue, in answer to the question, Has the mercury in amalgam fillings a toxic effect? He replies, "I have not made any experiments at all upon the toxic effects of mercury in amalgam fillings, perhaps because most of the patients for whom I have had the honor of operating have not, during my time, been subjected to a dull red heat, which is about the temperature required to produce either of the two poisonous salts of mercury."

Dr. Neall.—I came to learn something, and I have learned something. The way the essayist has handled the old information about alloys is gratifying. The new points he has made are also gratifying. I do not know much about the making of alloys, although I have had some little experience in placing the amalgam filling after the alloy has been made. I find that with two persons using the same alloy the results will differ: one will produce a good, solid, homogeneous filling, with good edge-strength, while the other will have a mass which in time will break down and become almost porous. Therefore, the working of the alloy is important, and no matter how good an alloy may be, if not worked properly it will produce bad results. My idea has always been that the material should be mixed in the mortar, afterwards transferred to the hand, and there further mixed to a plastic mass. When amalgam creaks under palm manipulation, it is good. As to toxic effects of the mercury, I may say that I

inserted a number of amalgam fillings for a gentleman some years ago, and later he came back and said, "I have terrible distress. My physician says that it is on account of the mercury in the fillings." In working over the young man I had to turn away frequently on account of the odor of his breath. After questioning him at length I found that he was suffering from nervous dyspepsia. I said, "If you will go to your physician and allow him to treat you for this trouble, no doubt you will get well." And I said, also, "If you will send your physician to me and let him tell me what effect free mercury in a person's mouth has, I will learn something." The physician did not come, but the young man has been a patient of mine ever since. He is perfectly well. There is another point that I would like to hear discussed, and that is, What becomes of the mercury after the filling hardens? In one of the dental journals some time ago, one of our learned brethren said that it had an effect upon the system; that it became free afterwards in the mass and did its bad work. I have been taught, and I have seen from experiments of others, that when a filling has been properly mixed, prepared, and placed in, one week after, two weeks after, three weeks after, and months after, it has the same weight. It does not seem to decrease in weight at all. My idea of the subject is, that the mercury in the amalgam goes deeper into the filling, becomes a solid part of it, and that in an amalgam filling you will still have the same weight.

Dr. Jack.—Mr. President, I have very little to say on this subject in addition to what has already been stated.

In respect to the mercurial action of amalgam fillings upon the constitutional conditions of patients, much has been written, and experiments have been made with relation to the possibility of that action taking place. Probably some of you remember that in 1874, under Dr. Bogue's auspices, in connection with Dr. Hitchcock, of Boston, experiments were made with twelve varieties of amalgams then in common use, principally directed to the question raised in this discussion as to whether the amalgams can have any toxic action upon the human system. Specimens of each of these amalgams were placed in a quarter-ounce of saliva with seven drops of acetic, nitric, citric, and hydrochloric acid. That is four experiments for each formula. The whole forty-eight were then submitted to a water-bath kept at about 100° F. for over three months. The loss in weight was stated to be only about three grains in

eleven pennyweights. Only citric acid appeared by these experiments to affect diminution in weight. The principal part of the loss was from the copper amalgam.

After the submission to heat and acids was completed the fluids of the test-bottles were joined together and submitted to Professor Chandler, who declared in his certificate that the samples of saliva contained no mercury in solution.

This would appear to settle the question. Dr. Bogue's paper will be found in Vol. VII., page 118, *Dental Cosmos*.

But there are circumstances and conditions under which amalgam fillings may produce constitutional effects, and these are, in short, that some amalgams are of such composition that they undergo electrolysis. I have observed fillings inserted with fulness, and after some years have found that they have lost substance. I have known some formulas of amalgam that I have used experimentally which in a few years were much reduced in quantity, showing that the fillings had been undergoing a process of electrolysis. This pertained to such as contained an excessive proportion of gold. If that action should be of rapid progress, one could readily admit that there could be some constitutional effect produced by the mercury or the metals compounded with or in association with mercury.

I might state, in some further elucidation of this subject and to illustrate my immediate remarks, that the copper amalgams undoubtedly had some influence upon constitutional conditions, for that was one of the results that occurred in the use of copper amalgam,—a very large proportion underwent a slow or rapid disintegration. Therefore, there might readily occur some constitutional disturbance. I had a patient at one time with several copper amalgam fillings who complained of disturbance of the throat, that had not occurred to her previously to their insertion. I removed them, and since then the disturbance has passed away. However, it is impossible for any one to establish the connection, because such a condition of the fauces might occur from other poisonous influences or constitutional conditions.

Dr. Huey.—I have, as you all have, been experimenting to a considerable extent with amalgams, and in years past have made a number of attempts to formulate an amalgam that would be better than any I could purchase in the shops. I must admit that I was not successful. As Dr. Flagg once said, It does not make so much

difference what is put into the crucible as what is taken out of it, and I found that, no matter how carefully I weighed my ingredients, I always had a loss, and I was not enough of a chemist to ascertain what that loss was; but be that as it may, I have always been able to purchase a better amalgam for use than I could make myself.

There are one or two points that I have observed in the use of amalgam that I would like to speak of. In the first place, all amalgams are difficult to make homogeneous, especially when mixed in the mortar. Particles of the amalgam adhere to the sides of the mortar and are difficult to remove. I hit upon an expedient a good many years ago of mixing the amalgam in my hand and then finishing it on heavy calendered paper with a glass pestle. I found that after rolling up the amalgam in a ball, I could mix it on the paper pad in half a minute more thoroughly than in a mortar or in any other way. There is one disadvantage, it makes the amalgam set more quickly, but pack beautifully. In the matter of packing, I inserted amalgam fillings for a good many years without having any appreciation of the difficulty of packing them, and it was not until I was making the experiments I spoke of and packed the amalgam into glass tubes, to ascertain whether it would shrink or not, that I appreciated the difficulty of packing amalgam. It takes very much more time than we commonly give to the insertion of amalgam fillings. After packing and filling in the ordinary manner in a glass tube, it is wonderful how many air-spaces exist between the filling and the tube, and how far a coloring fluid, introduced into the tube, percolates through these air-spaces. I then began to use the electric mallet in packing amalgam fillings, and do so now. After packing I rub off the surplus of mercury with bibulous paper, and pack again and again, until I make a fairly hard surface and build to the desired shape.

Dr. Jack.—If I may be allowed, I would like to say a word in support of what Dr. Huey has said. My method of mixing amalgams has been to do it in the mortar, for the reason that this method prevents admixture with the amalgam of water and oil of the skin as in the palm mix. After amalgamation in the mortar, I take the mass out, roll it and knead it in a napkin, to produce homogeneity.

In regard to inserting amalgams, my course is to pack them with the automatic mallet. This is similar to the method adopted

by Dr. Huey. That method produces what I believe to be a sufficient solidity and adaptation.

Dr. William Trueman.—There is necessarily a difference in amalgamating and inserting amalgams due to the formula. I think we should insist on knowing what the alloy is, and not use it blindly, as we are compelled to do when this information is withheld. I think the time has come when, in justice to our patients and our own reputation, we should insist on knowing the formula, at least sufficiently to enable us to use judgment as to how and when to use it.

Copper is an exceedingly treacherous metal to use in alloy where color is important. I was very much impressed, when spending an afternoon with Dr. Flagg some time ago, at his reference to copper. In conversation I mentioned a formula I had been using, and he said, "That is all right, but the copper will discolor." I said, "Why, doctor, that is its strong point,—it does not discolor." He said, "How long have you been using it?" I said, "Four or five years." He said, "I will give you two more to change your mind." He proved a true prophet,—I have changed my mind. I was very much surprised to learn that copper was an exceedingly treacherous metal,—only, however, where color is concerned. It gives the amalgam a much finer grain; it controls contraction and expansion; it is a reliable tooth preserver, and can be so graded that the filling may be finished up very nicely when first polished, and retains its color a long time; but I found that in six or seven years the fillings invariably tarnished, and sometimes became very dark.

In regard to aging, I think that is a very important matter. I had a peculiar experience some time ago. I made up a batch of alloy by a new formula, and to anneal it placed it in the oven of the kitchen range and gave instructions that it should be taken out in the morning before getting breakfast. It so happened that the fire burned up in the night more than I expected. When I came down in the morning they had a good fire, and I found my alloy still in the oven and it was pretty hot. Just after cutting it was a very quick setter,—even in a few minutes it became unworkable. After the heating it took about twenty-four hours to set. After some weeks it set hard in a few hours' time. I am accustomed to anneal my alloy when the furnace is going in the winter time, and put it in the heating chamber when there is a moderate fire,

letting it remain about a couple of days. It is not scientific, but very satisfactory.

The doctor, in speaking of making the alloy, referred to the difficulty of getting it thoroughly homogeneous. For some time I have been using, virtually, Dr. Flagg's plan. First fuse in the crucible enough borax to thoroughly cover the alloy. Not only should the crucible be lined with borax, but there should be enough at the bottom so that when the alloy is all in it is thoroughly covered; that may mean about an inch or an inch and a half deep when the borax is thoroughly vitrified. Increase the heat until this is as clear and limpid as so much water, then add the tin. It at once melts and sinks under the borax, where it is secure from oxidation. Now add the gold, platinum, and copper, rolled very thin; then the silver; stir it well with a clay pipe-stem, add any volatile metal, such as zinc, and immediately pour into the ingot. Dr. Flagg, I believe, prefers to commingle the metals and pour them together into the crucible as soon as the borax has attained the stage of thorough vitrification. The important point is to first get the borax well fused, and to use plenty of it. Oxidation is thus prevented. The melt leaves the crucible perfectly clean. The loss in making five or ten ounces by this method is very trifling; if there is no loss from "sputtering," it may not amount to a grain. Always break the crucible after pouring; the temptation is strong to use it again when we see it so nicely glazed, and so clean; the borax has a strong affinity for the material of the crucible, and invariably, when used a second time, the alloy goes through the bottom.

I prefer to comminute the alloy in a turning-lathe, and aim to get a thin, mat surface shaving. A planer or a shaping-machine does this better than the lathe. With a tin-silver alloy, the shaving will be well defined; if silver is the dominant metal, the alloy being hard and brittle, it breaks up into minute flakes. In either form I find that it takes the mercury much more readily than when reduced by the file. Although the tool is advanced very slowly, I find the turning-lathe more rapid and less fatiguing than the file.

In our gold work we find it desirable to use cohesive and non-cohesive gold. I think, to satisfactorily meet all cases requiring its use, that we need more than one formula of alloy. My preference is for amalgam containing a large percentage of tin. I have been making it for over forty years, and have been using it for nearly that length of time to my own satisfaction. To get the best result

it must be used dry,—mixed and ground up with the mercury and the surplus pressed out, so that when it is packed in the cavity, although it is not, as we say, set, it is pretty nearly as hard as it can be made. It is difficult to use it in this condition for contour work, where we have not good walls, unless a matrix is available.

When I want to contour, I prefer to have an alloy containing a large percentage of silver. I have been very strongly impressed with the fact that where the percentage of silver is too high you cannot get thorough amalgamation.

The different treatments required to get the best from alloys containing a high percentage of silver, or a high percentage of tin, is not thoroughly appreciated. If you mix them both in the same way, and pack them in the same condition, you will have poor fillings in each case. Properly treated and used, either will make good reliable work.

Dr. Hickman.—The essayist reminds me of an experience that I had with amalgam about two years ago. Some one introduced an imitation of the original Fellowship alloy, and they thought at first it was just as good as the Fellowship. A number of us took it up. It was somewhat cheaper, something new, so we started in to use it, and instead of getting hard, it proved a difficult-setting amalgam; it would get hard enough to polish, but in the course of a few days one could take an excavator and cut it out. I do not know whether that was due to the amount of zinc in the alloy, or what it was, but it taught a good many of us a lesson about going in diverse ways and using amalgam we did not know anything about.

Dr. Huey.—Allusion has been made to the Fellowship alloy. I have been using it and the Twentieth Century alloy, and have found them better than anything I have ever tried. They work so much alike that it is difficult for me to see any difference. It would be interesting to know if there are any new alloys, and it would be pleasant to hear the experience of those using alloys as to which are most successful.

Dr. Register.—I have never had any experience in making alloys for filling purposes. A number of years ago I was very much interested in finding out what metals changed their forms during crystallization, and to that end made an amalgam of mercury and gold and silver and tin and copper, each separately. I did not make one of zinc. I found that silver was the only one with mercury that crystallized, and the expansion was so great as to surprise

me very much. At that time I was testing the alloys I used in a little plate of steel containing a number of holes with tapering sides. If after filling one of the holes, as I would fill a cavity, I could push it out from the opposite side, I judged that the amalgam would shrink; and I could find out if it expanded by running a rule on the surface. The experimental mixes of pure gold and pure tin amalgam were very plastic and not much harder at the end of a week than when first made. Pure copper amalgam was persistently granular. Pure silver amalgam mixed nicely with some crepitation, but it crystallized rather quickly and became very hard. It expanded perhaps twenty per cent. of its bulk. I tested all the alloys I used at that time in the little matrix, and also kept an accurate record of the months in which I used them. In looking up these records of each alloy, which go back for about eighteen years, I feel much disappointed in a number that stood the matrix test, but were short lived in the mouth, the alloy having the best record for a long time being the "Globe" alloy, though later on its record shows that it had not proved so serviceable, so I gave it up for that reason and have not used it for a number of years. A number of fillings, however, made of Globe alloy twelve to eighteen years ago are doing good service to-day, but many have failed.

For the last three years or more I have been using Fellowship exclusively, to get results in the mouth in every service required. In compound cavities I use a very simple matrix made of very thin copper or German silver, anywhere from thirty-four to forty gauge. This ligated to the tooth by six to a dozen turns of a silk ligature permits close adaptation of the matrix to the cervical margin; it is also readily burnished to shape to form a knuckle contour, and permits mallet force or rotary burnishing with an engine burrisher, a means I prefer, as the heat generated temporarily softens the amalgam and consequently causes increased plasticity. My tests of Fellowship alloy are too recent for judgment of other than its fine working qualities. I commenced getting it in ten-ounce lots, and found that the last of the lot mixed better, there being less crepitation. Washing in alcohol removes oxidation and aids homogeneity. While we want our gold made fresh, I really think that there is an improvement in working qualities from aging. The thin copper may be obtained at Shannon's hardware-store, Philadelphia, or it may be made at any hardware-store.

Dr. Fellows.—As far as my experience has gone, I believe one per cent. of gold will give almost as good edge-strength, and will control color nearly as well, as five per cent. will do. I have also noticed that copper will replace gold in nearly every respect except color. I cannot agree that metals should be poured from one crucible to another, for when metals are heated to that extent, they are thoroughly incorporated, and if exposed to air while pouring, the tin and zinc at once will oxidize, and a part be lost. To keep the original quantity, do not expose it to the air.

An amalgam with too great an amount of tin, and possibly one containing too great an amount of zinc, would suffer more or less loss by attrition, a fact which may explain Dr. Jack's contention.

While pure copper amalgam is of questionable utility, alloys containing copper and gold together, as subordinate or modifying constituents, are very valuable. The latter combination prevents tarnishing.

Dr. Huey mentioned tube tests. They enable us to see whether our manner of packing is faulty. I do not believe one can pack amalgam well without force, either mallet or rotary. If our amalgam does not set too rapidly, and goes into the cavity in small pieces and is thoroughly packed, we will get a thorough filling and one which will fill the cavity absolutely, especially when a matrix reduces the compound cavity into a simple one. Dr. Trueman mentions copper modified amalgams, and claims that they will show discoloration in the course of from five to seven years. I have some fillings I have had in use for nearly fourteen years, and I cannot say they are affected in the least. Dr. Register mentioned the keeping of records. I think this is an excellent thing. I have a register of nearly every filling which I have put in, of whatever material, and when a patient returns to me after a number of years, I am able to see what kind of a filling serves best. I think that is the way we ought to study materials. He also mentioned the "Globe" alloy. Different makers of that alloy no doubt have produced different results, even in the same firm of manufacturers, just as different bakers make different bread from the same formula. All alloys brought into our offices to be put into teeth should be tested by us, and if not satisfactory, they should be returned. I have kept amalgams at times for some years, and have found a great deal better success in working them than when they were first

made. I think it is probably due to the fact that the air acts upon the particles and oxidizes them.

Dr. Cryer.—Several gentlemen have spoken about packing the amalgam in glass tubes. I would recommend the roughening of the inside of the tubes, as it approximates more closely the conditions present in cleansed cavities in teeth. One can pack a filling much better, with closer adaptation to the walls, than with the smooth glass, and you will not have the penetration of aniline coloring fluid between filling and tube wall nearly so great.

The same amalgam packed into smooth and roughened tubes can be pushed from the former when hard, while from the latter it cannot. The latter is, therefore, not a good test for shrinkage.

OTTO E. INGLIS.

Editor Academy of Stomatology.

UNION MEETING OF THE NEW YORK INSTITUTE OF STOMATOLOGY AND THE AMERICAN ACADEMY OF DENTAL SCIENCE.

A UNION meeting of the New York Institute of Stomatology and the American Academy of Dental Science was held at Hotel Somerset, Boston, on the evening of March 21.

There were present sixteen members of the Institute and twenty-eight members of the Academy. The following gentlemen were also present as guests of the Academy: President C. W. Elliot, of Harvard University; Hon. J. J. Myers, Speaker of the Massachusetts House of Representatives; Rev. Dr. George A. Gordon, pastor of the Old South Church; Professor C. S. Minot, of the Harvard Medical School; and Harold Williams, M.D., Dean of Tufts College Medical and Dental Schools.

An hour of social intercourse was spent in the parlors of the hotel, after which a banquet was served, and an address of welcome delivered by Vice-President George F. Eames, of the Academy.

President Elliot was then introduced, and delivered a short address upon "The Newness of Dentistry."

(For President Elliot's address, see page 289.)

"Dentistry in its Relation to Medicine" was the subject assigned upon the programme to Dr. George S. Allan, of New York.

(For Dr. Allan's address, see page 406.)

Professor Minot took for his theme "The Union of Dental and Medical School."

(For Professor Minot's address, see page 393.)

The Rev. Dr. Gordon addressed the two societies upon "Dental Service as a Ministry to Life."

(For Dr. Gordon's address, see page 402.)

Dr. E. A. Bogue, of New York, read an interesting paper entitled "The Hand the Servant of the Brain."

(For Dr. Bogue's paper, see page 397.)

Dean Williams, in the course of his remarks, urged the necessity of a four-year course in the study of dental medicine and the establishment of a larger number of dental infirmaries for the benefit of the poorer classes.

Hon. J. J. Myers spoke in a happy vein upon "The Commonwealth as Benefactress and Beneficiary."

Dr. J. Morgan Howe, of New York, took for his text "Professional Dignity," and Dr. S. E. Davenport, of New York, gave utterance to the feeling entertained by all the members of the Institute present that the meeting had been a most pleasant and profitable one, expressing in conclusion the hope that a year hence the members of both societies might come together again in a similar union meeting in New York City.

On motion, adjourned.

CHARLES H. TAFT,
Editor American Academy of Dental Science.

HARVARD ODONTOLOGICAL SOCIETY.

At a meeting of the Harvard Odontological Society held in Boston, September 28, 1899, a paper was read by Frank R. Dickerman, D.M.D., of Taunton, Mass., entitled "Some Effects of Immigration from a Dental View."

(For Dr. Dickerman's paper, see page 384.)

DISCUSSION.

President Clapp.—We have listened to this very interesting paper on a subject that is somewhat new to us, and consequently is of greater interest on that account. When I read the subject of the paper, I did not have my operating-glasses on, and I read it "Some Effects of the Imagination" instead of "Immigration." Now, we will not charge the doctor anything for the suggestion, but hope he will write us a paper on that subject also.

Dr. Taylor.—Perhaps in my position in practice in the city I see as large a proportion of the foreign born and those of foreign parentage as almost any member of the Society. I think I have no real definite statements to make as to the results of immigration, except this one point that has been frequently brought to my attention. People tell me that in the old country (wherever that may be) their teeth were very good; that they did not have any trouble with them at all until after they had been in this country a few years, and their trouble dated from the time of their arrival. If such is the fact, it is very difficult to say to what it may be due. It may be to change of food, or to the fact that their habits of life are very different in this country from what they were in the foreign countries from which they came. Perhaps the largest proportion of those who have complained to me in that way have been young women, mostly of the Irish or Swedish races, and I think largely those who have entered domestic service in this country, having previously been engaged in some form of manual or field labor in the countries from which they came; that is, the kind of labor has been changed from an out-door occupation to an entirely in-door service. At the same time, it is undoubtedly a fact that the peasant classes in the European countries live on a different kind of diet from the people who serve in the kitchens of American families. I think that perhaps both those things have a strong effect on the condition of the teeth. A change from the coarse and comparatively plain food of the old countries to the rather more delicate and highly prepared food of the American kitchen must have quite a good deal to do with the teeth, inasmuch as the teeth are not called upon for so much exercise. It is probably a fact that in the countries from which they came very little care is necessary in order to keep the teeth clean, as the coarse foods that are used and the consequent mastication required have a cleansing effect upon the teeth.

Bearing in mind these facts, of the change in diet, and the entire change in the habits of life, it hardly seems to me that the subject of the effect of immigration upon the teeth ought to be considered, except from the stand-point of the effect of the mingling of races.

Dr. Blaisdell.—I think we are overlooking one point in this discussion. Dr. Taylor has referred to the difference in the character of the teeth of a certain class of people,—domestics,—stating that they have changed their modes of life entirely. If we want to make a comparison to show the effect of immigration, we should take a class of people who pursue the same life here that they did before they came to this country. For instance, suppose we take Italian laborers. They come here and do about the same character of work as they did in their old homes, and how often are they in need of dental service? Around Portsmouth we have had in the last four or five years a good many Italian laborers employed in the streets, water-works, etc., and I cannot remember of seeing more than two at the most, and their conditions were due more to accident than decay.

It seems to me that a change in the habits of life would have more to do with a depreciation in the character of the teeth than would the mere fact of immigration to this country.

I have noticed this marked change in regard to the teeth of Norwegian girls, but I do not know the life that they led in their old homes. I have seen a number of those girls who have come to this country at the age of about eighteen to twenty, and it is not very long before their teeth begin to decay. Whether it is a climatic effect or change of habits, I am unable to say. We ought to take more pains in following out the history of such cases.

Dr. Field.—Another point we have to consider in this matter of immigration is the effect of change of climate. While practising in London I had an opportunity of observing the bad results that I believe to be due to change of climate and modes of life. A great many men are sent out from England to India, Africa, and Australia, to do government service for varying terms of years in those countries, and in most cases the effect of the climate seems to produce more or less retrogression in the condition of the teeth, and it was understood in the office that everything possible should be done for such patients to prevent the inevitable inroads of decay, for, even with the best care they could get, they would come back

in a bad state. If I were to give an opinion, I would say that the retrogression in the quality of teeth was due to a change of climate or change in the habits of life, rather than to the intermingling of races.

Dr. Reilly.—If I were to express my opinion, it would be to endorse Dr. Blaisdell, and attribute it wholly to the food and change in the manner of living. I think if you take the same grade of civilization and occupation of any of the races, that you will find the same conditions of the teeth. The domestics that we get, a great many of them, come to this country from seventeen to twenty years of age, and enter domestic service. Previous to that many of them have done nothing, except possibly to assist about the house. As to the field life, I think that is a thing of the past, at least in Ireland. The women and girls do such work about the farm-house as you will find them doing in New England, but to go out into the field and follow the plough and harrow, etc., I think there is very little of that done in Ireland to-day. It may be done in Germany and Sweden, but in Germany you will find just as severe ravages among the teeth of the upper classes as you will find among the peasants.

At the time of the building of the subway, most of the laborers employed in the work were Italians. There were some Irishmen, who generally held some advanced position, such as the boss of a gang. Quite a section of it was built in front of my office, and I could look out of the window and see the workmen eating their dinners, and it was interesting to see the difference between the Italian's and the Irishman's dinner. Some of the Italians had dinner-pails, but in many cases, almost universally, the Italian at the noon hour would go to his coat on the bank and fish out a long roll of dry bread and break it into pieces and sit there munching it without drinking anything with it, at least while he was eating. With the Irishmen, in many cases the wife would come with a large pail, sometimes with one or two children accompanying her, and the foreman would go off under some tree, spread a napkin on the grass, open the pail, and go at the food with knife and fork; and oftentimes the children would squat down and partake of the dinner. Now, in my mind the teeth of the Italian would outlast those of his boss, because the Italian used his teeth more.

As to girls in domestic service, I have done work for a great many of them. I have questioned many of them, and they tell

me that they are tasting and nibbling food all day long, especially kitchen girls, and of course you cannot expect them to have clean teeth under those circumstances.

As far as the climatic effect is concerned, I do not think there is anything in it. I judge it to be wholly a question of food and care. If the teeth are cared for and exercised, I think they would be better in quality.

For a long time I have had charge of the teeth of some cloistered ladies in a religious institution, where they eat no meat at all. I do not imagine that they take soups. Their diet is of the plainest kind,—the different kinds of bread, vegetables, fish, milk, and a very little pastry. Of course such food does not require a great amount of mastication, but those ladies have excellent teeth. They care for their teeth, they have been instructed to, and they are under dental care all the time; at least their teeth are examined twice a year, and they have as fine teeth, I think, as the same class of people outside.

That brings up a little matter in connection with my own family,—the contrast in the quality of the teeth of my boy, fourteen years of age, and a girl of fifteen. The girl has always been healthy from birth. A year ago I put in fifteen cement fillings for her. The boy, up to the age of eight or nine was very delicate. The first year of his life we never thought we could pull him through, as he suffered severely with indigestion or malnutrition, and was at death's door several times. Within the past few years he has had but two or three permanent teeth filled. I looked for the boy's teeth to be poor, but he has excellent ones. I cannot explain this difference. Perhaps a remote explanation might be found in heredity, as the teeth of all the members of my wife's family are very poor; on the other hand, the teeth in my family are very good, better than the average. It cannot be the care, for I try to see that they are cared for equally well. If anything, the girl takes the better care of her teeth. A peculiar thing about it is that if the girl should neglect to brush her teeth for a day or two, I can detect it across the table, but I cannot with the boy.

Dr. Field.—In my remarks with regard to climate I did not mean to convey the impression that I considered change of diet or change of habits had no effect upon the condition of the teeth, because I do believe that any change which affects the system, such as change of food, habits of life, occupation, climate, or any other

change which will produce an altered condition of the system, will also have its effect upon the teeth.

Dr. Holmes.—I do not see how we can always attribute the condition of the teeth to the food eaten. The Chinaman has pretty good teeth, and his diet is principally rice; possibly a few times a week he will take meat. The South Sea Islander has excellent teeth. His diet is a substance called poi, of a very thin consistency. They designate it as one-finger, two-finger, or three-finger poi, as it can be taken up by one, two, or three fingers from the dish. Their teeth have no work to perform so far as masticating their principal diet is concerned. Then there is the Scotchman. Many of them live principally on a sort of porridge that requires very little masticating. It has been the custom to place a good deal of stress on the influence of the Scotchman's porridge, as well as the coarse breads, etc., in the nourishing of teeth and building them up, but I have seen it stated on good authority, and as the result of many years' experience, that more benefit was to be derived by the teeth from a general vegetable and meat diet than by eating too much coarse bread; in fact, that in a general diet, what we call white bread would serve its purpose better than the coarse bread, because, in trying to assimilate the coarse bread which was taken into the system with a general diet of vegetables and meat, the best results from the whole were lost. If a wholly bread diet is to be depended on, the coarse bread is better; but living as we do, on quite a varied menu, the bread as prepared to-day, from a finely pulverized flour, is more thoroughly assimilated.

Dr. Dickerman.—I think Dr. Holmes is mistaken when he states that the Chinese live almost entirely on rice. A resident of Shanghai told me that the Chinamen used his rice in the same way as we do bread; that is, that it appeared at every meal, and in many cases they may make a meal of it; but the Chinese are great pork-eaters, and where they can afford it, fowl, ducks, geese, chicken, and the various meats and vegetables. The rivers in China near the large cities are sometimes completely covered with duck-farms, which supply the wants of the people.

About the South Sea Islander, I think you will also find that considerable pork and fish are included in his diet, and that they cannot be said to be entirely dependent on poi.

Dr. Holmes.—I would say that what I intended, in referring to the rice as used by the Chinamen, and the poi as used by the South

Sea Islander, was to show not only that a diet might not include much animal matter, but that the teeth had but little work to do in the eating. There is a good deal of stress laid sometimes on the work that we give our teeth to do, as though that were a great factor in their preservation, so I just simply mentioned that to show that in some cases the food that is the principal article of diet of a people does not give their teeth much work to perform.

Dr. Blaisdell.—Speaking of the teeth of the Chinese and Japanese, I have never seen any of that class who act as laundrymen, but I have seen a number of those who serve on board our government ships in the capacity of stewards, etc., and for cases of pyorrhœa, I think the Americans cannot compare with them. I really dread to see one of them come into my office. I have never seen an old Chinaman or Japanese, and out of curiosity I would like to see what would be the condition of their teeth in old age. I remember seeing one or two in California that were old, but they were minus teeth.

Dr. Dickerman.—The class of foreigners that I have come mostly in contact with, and those of foreign-born parentage, are Portuguese and French Canadian. The Portuguese come here and perform manual labor either in the brickyards, or on sewer gangs, street gangs, and what not, or become farmers, and their children either help on the farms or go into the cotton-mills. Those people seldom marry outside of their race, and are particularly clannish. Of course, in the seaport towns some go to sea, but there is a good deal of difference in the teeth of those people who have the outdoor life and those in the cotton-mills. Whether the girls are in the habit of using snuff or not, I do not know, but the teeth look very much like it. Still, that is more a question of environment. But take, for instance, the teeth of the grandfather, father, and daughter, and you can see a distinct change from one generation to the other, not only in the number of cavities, but in the size and shape of the teeth. The molars seem to grow more rounded instead of the large, heavy, square teeth, and the third molars get smaller and more crowded and are of no use at all, and it seems to me that, taking those teeth where you can see the three generations, it forms quite an interesting study.

Dr. Reilly.—I would like to ask Dr. Dickerman regarding the condition of the teeth of snuff-users. Why I ask is because, in my old home, Lowell, which is a manufacturing town, the mill opera-

tives there are almost universally addicted to that habit, and whenever a few of them get a spare moment, it is devoted to a "scour." They take a waste rag, wrap it around the finger, wet it and dip it into the snuff, and scour away at the teeth; and they may be seen any noon hour in little squads on the banks of the river, and summer evenings in the fields, doing that. Since then I have often wondered what effect that had upon the teeth. It is a habit that has been imported from England, from the manufacturing communities there.

Dr. Dickerman.—The cotton mills in Taunton, where I live, make the higher grades of dress cloths, and there is not so much of that done as in the mills that do their own spinning. In Fall River, I think, every corner store has a pyramid of snuff-cans in the window, and they sell thousands and thousands of ounces annually. I have noticed that the spinners who come to Taunton from Fall River usually have a broad black line right under the gum. Many of them have pyorrhea, which is no doubt caused by the constant irritation. I do not think they use waste in Fall River. They usually take two or three wooden toothpicks and chew the ends, which makes a sort of brush, and dip that into the box and brush their teeth with it, and of course those wood fibres get down under the gums and make bad work. The gums are invariably soft and bleed easily, and it makes a filthy mouth.

Dr. Giblin.—I cannot add anything further than to corroborate what has been said. I believe that change of habit and food often produces considerable havoc in the condition of the teeth of immigrants. Certainly I have myself seen cases of both sexes who have come to this country with magnificent teeth, and that shortly after coming here rapid decay of the teeth has occurred which has been very discouraging to both patient and dentist in attempting to control. I am inclined to believe that this is altogether consequent upon their change of food and in their social environment.

HARRY WEST HALEY,

Editor Harvard Odontological Society.

Editorial.

THE DUTIES AND RESPONSIBILITIES OF THE EDITOR.

THERE is no position, possibly, that calls for a greater amount of judicial care outside of the courts than that of an editor, whether that be as head of a daily paper or the conductor of a professional journal. Each, in its way, represents a variety of thought, and to harmonize this contrariety of opinion is an impossibility, and all that can be expected as a result of effort will be to lead this thought, if possible, into channels not subversive to the general good or of professional inharmony.

The ideal editor is one who can divest himself of personal prejudice and view all sides of a controversy without partisan bias. This very exalted condition may not be possible of attainment by any, but the nearer it can be approached will the individual effort be for the general or professional good. This does not mean that an editor must occupy a negative position, one always on both sides of every question. Such a position is always indicative of weakness, and this will be reflected upon the paper or periodical, and in the end it must fail to exert any influence upon its readers.

Independence of thought and a courage to express that thought must be part of the mental training of every editor. He will be met on all sides with opposition, and rarely will he receive the credit due his exertions, but, whether in sunshine or storm, he is forced to maintain that equable temper that regards the one with the same complacency as the other, each the result of natural law and to be continually repeated in his experience.

The independent thinker is necessarily an iconoclast, the breaker of images. This means criticism from those who fail to see the end from the beginning, or who fail to take a broad view of conflicting interests, or who from selfish motives are unwilling to make any sacrifice for the general weal. The true editor cannot permit either criticism or personal interests to influence his pen.

In a professional journal, the organ, in a practical sense, of a large body of intelligent practitioners, it becomes of vital importance that the conductor should write, not as the mouth-piece of a clique, but as an exponent of the truth as he has been able to discover it. He is equally liable to incorrect conclusions as his critics, but the effort on his part to avoid error is influenced by motives that rarely actuate others not thus situated, and are, therefore, more nearly correct.

A professional journal should be conducted upon broad principles. It should be a forum in which could be heard all variety of opinion. Personal clashing should have no place there, but when personal antagonisms upon subjects of general interest are aroused, the views pro and con should find a place upon its pages. Any other course would be subversive of the highest interest of the profession it, in a measure, represents.

The views here outlined have been forced upon the writer's attention by recent occurrences in the dental ranks, and through which the entire attitude and responsibility of the editor to the profession he represents has been forcibly brought into view and, doubtless, has claimed the attention of readers of dental journals.

In the April number of this journal a communication was accepted, after a free use of the editor's privilege of cutting out objectionable matter. It was an answer to the charges made in a previous issue of the *Dental Digest*. These were a severe arraignment of certain parties, members of the Dental Protective Association, because they had accepted the terms of the International Crown Company and paid the demand for royalties upon work done during the life of the patent. This answer, when sent to this journal, was accompanied by the statement that it had been sent to the editor of the *Dental Digest* and had been refused insertion. In the interest of a fair hearing to all sides of a controversy, it was accepted with the changes alluded to previously. It subsequently appeared that the same communication had been sent to other journals. Had this been stated at the time, it would not have appeared, for the reason that the INTERNATIONAL DENTAL JOURNAL cannot be forced into a literary partnership for the dissemination of personal antagonisms.

In connection with this communication was given the decision of Judge Townsend, for the reason that it had not been published previously in full, and it was deemed important that the readers

of this journal should have the entire text as delivered. In addition to this the writer felt that the subject required some leading thoughts in the hope that the editor of the *Dental Digest* and president of the Dental Protective Association would frankly explain some very peculiar statements in Judge Townsend's decision. It was thought this was due the members of the Protective Association. It was distinctly understood, however, that the dental journals should not be the medium for a retrial of this case.

The profession received its answer in the April number of the *Dental Digest*, in which the president of the Dental Protective Association publishes in full the aforesaid communication of Dr. Holbrook, and then proceeds to denounce it and those who published it in no measured terms. This editorial seems to the writer to fail in proportion to the amount of temper exhibited. Personal lashings will not satisfy the critical mind,—in fact, they tend to arouse other thoughts not conducive to that harmony and co-operation so essential at this important period.

The position of the editor of this journal has, it is presumed, always been so plain to its readers that it scarcely seems necessary that it should be restated. He has labored earnestly to establish a journal free from all entangling alliances, and to offer a field where all sides were free to enter and be heard with proper limitations. Criticism has been ever welcomed when free from personal abuse. Men wronged by adverse public criticism could find upon its pages room to correct aspersions upon professional character. In a word, it has under its present management been independent of all cliques and ever an open place for all to secure a hearing. The INTERNATIONAL DENTAL JOURNAL has stood for this from the beginning, and should it fall from this high position it must be under other editorial management.

Its attitude towards the Dental Protective Association has never been of a negative character. After the Niagara meeting, where Judge Townsend's decision was explained, this journal endeavored to rouse the apathetic to a full realization of the peril to which those not members of the Protective Association were subjecting themselves by delay in joining that body. That this appeal was productive of good results is well known to the writer. There has never been an occasion since to change the sentiments then expressed, and the publications alluded to were intended, in part, as an incentive to draw out the President of the Protective Associa-

tion into some effective answer that would silence the fears of the timid in that body. There are great interests at stake in this matter, and nothing is so productive of suspicion as a want of frankness. The President of the Dental Protective Association has been given the confidence of the dental profession as no man previously to his advent, and it is doubtful whether any other man could have held this during all the years he has untiringly worked. It is because of this confidence that his best friends are not willing to have him maligned, as they conceive, without just cause, and they were anxious and had a right to expect something more than a general defamation of his antagonists by name.

The writer has been a member of the Dental Protective Association from the beginning and proposes to continue to the end. He knows that the affairs of this Association have been honestly conducted, and all practitioners of dentistry in this country know of the self-sacrificing energy of its president. That he will lead the good ship into quieter waters is well assured, but he must remember that he occupies a public position and can never be free from the criticisms and false statements of the narrow-minded and the selfish.

This journal has never had any sympathy with those who truckled to the demands of the Crown Company. It will be time enough to do this when the court of last resort has been reached and the decision given, but until this time arrives the entire confidence and earnest co-operation should be accorded to the President of the Dental Protective Association.

THE DEATH OF DR. CUSHING.

THE death of Dr. George H. Cushing, late of Chicago, but recently resident in California, took place in the latter State, Friday, May 25, 1900. This brief announcement by telegraph of the departure of this prominent man from a life of professional activity is all the information in the writer's possession as this number goes to press. The more extended account of his life work must be deferred until our next number.

Domestic Correspondence.

ON THE USE OF NITRATE OF SILVER.

TO THE EDITOR:

SIR,—Apropos of Dr. J. Morgan Howe's article, "Notes on Nitrate of Silver," the method of application is of importance. In numerous cases, some of which are mentioned in the paper, the conditions presenting where the nitrate of silver treatment is indicated make the application of a caustic a serious matter, because of certain difficulties. The greatest of these is keeping these surfaces dry, as the salt is so quickly dissolved by contact with saliva that the gum is usually cauterized also. I read somewhere that by heating the end of a German silver probe to nearly or quite red heat, and dipping in the crystals of the salt, some little would fuse on the probe, making it an ideal carrier and applicator. I have used it thus many times during the last year with great satisfaction. If Dr. Howe would give us the details of how he uses the caustic, it would be thankfully received.

H. R. NEEPER.

Notes and Comments.¹

DEATH UNDER NITROUS OXIDE GAS.—The following paragraph from a recent issue of the New York *Herald* tells the story of a death supposed to be due to the effects of nitrous oxide gas:

"George F. Terrell, master mechanic for the American Pin Company, of Waterbury, Conn., took his twelve-year-old son, Andrew, to the office of Dr. Virgil Munson, a dentist, this afternoon. The boy was suffering severely from an aching tooth—one of the big molars. He refused to submit to the operation without an anæsthetic, and was given nitrous oxide, known as laughing gas. The tooth came easily, but the boy died within a few minutes. The

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

doctor says there was apparently no physical reason why the youth could not stand the anæsthetic, but friends of the boy are dismayed."

ON THE ADVANCE IN DENTAL EDUCATIONAL REQUIREMENTS.—In the *Items of Interest*, Dr. L. Ashley Faught very well says that to the close student of the history of dental instruction in the United States it is apparent that we are entering to-day upon a new era,—that in which a sharp distinction will be drawn between the general development of the understanding and the special training necessary for the following of a special pursuit. A third stage in our career has been reached. It is not a new creation,—not even a new beginning,—but an evolution from what has preceded it.

Briefly stated, the stages are these: A chaotic period reaching from the inception of the profession up to about 1890 of heterogeneous and indefinite educational entrance requirements. Then for nearly a decade, up to 1899, a second period, marked by the struggle to establish a homogeneous and, as progress was made, a high and definite qualitative educational entrance requirement. The third stage,—that of to-day,—the working out of the qualitative factor.

PERFECTION IN DENTAL OPERATIONS.—Dr. Grant Mitchell, in the *Dental Brief*, says,—

"Even among the students who imagine that gold fillings constitute the dizzyest heights of dental possibilities, the majority succeed in mastering only the meagre rudiments of their proper introduction, and fail to grasp, in their fulness, as in their refinements, the underlying principles of that department of practice; they do things thus and so because the demonstrator told them to! Failing to get at the 'reason why,' they never come to an understanding of the all too evident fact that dentistry offers no middle ground upon which to stand; that nothing may be effected which will merely 'answer the purpose;' that operations are accomplished perfectly, or they are simply imperfect; and that there cannot exist a 'slight' imperfection in any dental operation."

REMEDIES FOR THE OFFICE.—In reply to an inquiry from a "recent graduate" as to the best stock of medicines for one in fitting up an office, we cannot do better than give the advice offered by Dr. Welch in writing upon the subject. He said it was much better to have a few good familiar remedies on hand than many that you are in doubt about, or that you are experimenting with. So with your treatment of a given class. Make a study of them till you are clearly satisfied with what you should do, and then do it. Continually varying your remedies and your practice is confusing, and tends to indecision and unreliable practice. Not that we should never take on anything new, or never discard anything old, or never vary our practice, but have some things settled, and as many things settled as possible, and then in investigating new things or processes go at it deliberately, systematically, and intelligently, and settle that. This never knowing and being forever coming to a knowledge of the truth is vexatious, bewildering, and childish.

Current News.

RESOLUTIONS REGARDING DR. J. N. CROUSE AND THE DENTAL PROTECTIVE ASSOCIATION.

THE following resolutions were adopted by the Illinois State Dental Society, at Springfield, May 9, 1900:

In view of the recent activity on the part of the International Tooth Crown Company, their agents and allies, both in and out of the profession, and the appearance at the same time in some of the dental journals of articles reflecting on the management and tending to destroy confidence in the Dental Association, the Illinois State Dental Society, in the thirty-sixth annual meeting assembled, deems it most opportune at this time to again put on record its confidence in and loyalty to the Association and its management, which has made of it such a wall of protection to the entire profession.

This Society desires also in the most emphatic manner to express its confidence in the personal integrity of Dr. J. N. Crouse, and hereby records its deep appreciation of the unselfish personal sacrifices that he has so freely made, for so many years, for the good of the cause.

This Society considers the cause of the Dental Protective Association the cause of the profession, and it condemns as inimical to the interests

of the entire profession the circulation of slanders by travelling men or the publication of articles that are calculated to weaken the hands of those who are fighting our battles and to put weapons into the hands of our enemies. And this Society hereby calls upon all those who have the good of the profession at heart to give the Dental Protective Association a most cordial and unqualified support, and counsels them to show in no uncertain way their utter disapproval of all those who give aid and comfort to the common enemy.

C. B. ROWLAND.

E. K. BLAIR.

J. G. REED,

Committee.

NATIONAL DENTAL ASSOCIATION, SECTION III.

At the last meeting of the National Dental Association, it was decided by Section III. to make the work of this section a feature of the meeting. To this end it has been arranged to hold the meetings of this section at such times as will not interfere with the general sessions. All papers upon the subjects embraced in this section will be read in these meetings excepting two or three, which, from their general interest, have been selected by the committee for presentation to the general body.

A suitable room will be provided and the programme for each meeting duly announced. Some good papers are promised.

It was further decided to hold clinics. These will comprise operations upon patients and demonstrations upon casts, models, etc. It is desired that every one who has anything new, original, and helpful will bring or send his appliances, models, and illustrations. While new appliances may be shown subject to the provisions of the constitution, nothing can be offered for sale. Suitable provision will be made for the carrying out of these clinics.

Let every one interested in this section who has anything to offer communicate at once with

THOS. E. WEEKS, *Chairman*.

Dayton Building, Minneapolis, Minn.,

JNO. J. HART, *Secretary*,

118 West Fifty-fifth Street, New York.

or THOS. P. HINMAN, *Chairman Clinic Committee*,

Atlanta, Ga.

MASSACHUSETTS DENTAL SOCIETY.

THE thirty-sixth annual meeting of the Massachusetts Dental Society will be held in the American House, Hanover Street, Boston, on Wednesday and Thursday, June 6 and 7, 1900. The meeting, clinics, and exhibits will all be held under one roof. An especial clinic is to be given on Porcelain Work by a prominent Philadelphia dentist. Good talent is also promised both for papers and other clinics. The exhibits will also be extensive. The hotel will give special rates and good accommodations. It is hoped that a large number will be in attendance, and a cordial invitation is extended to all reputable dentists to be present.

EDGAR O. KINSMAN,
Secretary.

CAMBRIDGE, MASS.

INTERNATIONAL DENTAL CONGRESS.

AT the International Dental Congress, to be held in Paris, France, August 8 to 14, 1900, the following papers will be read by the gentlemen named:

A. K. Fort, D.D.S., Atlanta, Ga., "The Influence of the Saliva on Bacterial Growth in the Mouth;" W. A. Price, D.D.S., Cleveland, Ohio, "The Science of Dental Radiography" (illustrated); Richard Grady, M.D., D.D.S., Baltimore, Md., "Instructing our Patients in the Care of the Mouth and Teeth;" R. R. Andrews, A.M., D.D.S., Cambridge, Mass., "The Development of the Enamel;" Geo. W. Cook, D.D.S., Chicago, Ill., "A Bacteriological Study of Pyorrhœa Alveolaris;" C. S. Case, M.D., D.D.S., Chicago, Ill., "Important Principles in Dento-Facial Orthopædia;" R. H. Hofheinz, D.D.S., Rochester, N. Y., "Our Preliminary Educational Deficiencies;" E. H. Angle, M.D., D.D.S., St. Louis, Mo., "The American Type of Dento-Facial Deformity;" J. E. Hinkins, D.D.S., Chicago, Ill., "The Chemical Action of Cements in the Mouth;" I. N. Broomell, D.D.S., Philadelphia, Pa., "The Source of Nutrition of the Dental Pulp;" T. W. Brophy, M.D., D.D.S., LL.D., Chicago, Ill., "Surgical Treatment of Palatal Defects;" W. C. Barrett, M.D., D.D.S., Buffalo, N. Y., "International Dental Ethics;" B. Holly Smith, M.D., D.D.S., Baltimore, Md., will

open the discussion on "Education;" Jonathan Taft, A.M., M.D., D.D.S., Cincinnati, Ohio, "Dental History;" A. W. Harlan, A.M., M.D., D.D.S., Chicago, Ill., "Pulp Digestion;" E. R. Warner, M.D., D.D.S., Denver, Col., "Some phases of Mummification."

It is expected that a few additions may be made to this list.

The following gentlemen will give clinics:

W. V.-B. Ames, D.D.S., Chicago, Ill., "Some Possibilities of New Process Oxyphosphate of Copper;" Gordon White, D.D.S., Nashville, Tenn., "A Compound Filling, using in the Cavity Tin, Abbey's Non-Cohesive Gold, and Nickold's Cohesive Gold;" Joseph Head, M.D., D.D.S., Philadelphia, Pa., "Porcelain Inlays;" Alfred Owre, M.D., D.D.S., Minneapolis, Minn., will prepare a step cavity in an incisor or bicuspid, and fill same with DeTrey's Crystal Mat Gold (Solita); Joseph W. Wassall, M.D., D.D.S., Chicago, Ill., "The Treatment of Septic Pulpless Teeth;" Hart J. Goslee, D.D.S., Chicago, Ill., "Porcelain Crowns and Bridge-Work;" Robert Good, D.D.S., Chicago, Ill., "Porcelain Bridge-Work;" V. H. Jackson, M.D., D.D.S., New York, "Jackson's System of constructing Appliances for the Correction of Irregularities of the Teeth;" Levitt E. Custer, D.D.S., Dayton, Ohio, "The Electric Oven, and Electric Gold Annealer;" W. E. Griswold, D.D.S., Denver, Col., "A Removable Crown for the Support of Saddle Plates or Bridges;" E. K. Wedelstaedt, D.D.S., St. Paul, Minn., "Gold Filling,—Mesio-Occlusal Cavity in Upper First Molar," demonstrating Dr. C. V. Black's method of (1) cavity preparation, (2) extension for prevention, (3) occlusal anchorage, (4) the use of annealed and unannealed gold, (5) method of finishing (using the Black saw and finishing files), (6) proper contact, also (7) the scientific application of the rubber dam, and (8) the Wedelstaedt system of measurement, and its application to cavities in the human teeth; Frank Holland, M.D., D.D.S., Atlanta, Ga., "Cohesive Gold Filling;" T. W. Brophy, M.D., D.D.S., LL.D., Chicago, Ill., "Surgical Treatment of Congenital Cleft Palate."

There are three or four additional clinicians to be heard from.

A. W. HARLAN, *Chairman.*

W. E. GRISWOLD, *Secretary.*

WISCONSIN STATE DENTAL SOCIETY.

THE thirtieth annual meeting of the Wisconsin State Dental Society will be held at La Crosse, Wis., July 17, 18, and 19, 1900. A cordial invitation is extended to all members of the profession to be present.

W. H. MUELLER.

Secretary.

CALIFORNIA STATE DENTAL ASSOCIATION.

THE California State Dental Association will hold its annual meeting in San Francisco, June 19, 1900, continuing four days.

W. B. KING,

Secretary.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the annual meeting of the Central Dental Association the following officers were elected for the ensuing year:

President, H. S. Sutphen, Newark; Vice-President, F. G. Gregory, Newark; Secretary, N. M. Chitterling, Bloomfield; Treasurer, Chas. A. Meeker, Newark.

Executive Committee.—J. S. Vinson, Newark; F. L. Hindle, New Brunswick; C. W. Hoblitzell, Jersey City; J. W. Fisher, East Orange; P. G. Voegtlen, Madison.

NELSON M. CHITTERLING,

Secretary.

COLORADO STATE DENTAL ASSOCIATION.

THE fourteenth annual meeting of the Colorado State Dental Association will be held in Boulder, Col., Tuesday, Wednesday, and Thursday, June 12, 13, and 14, 1900.

Indications point towards an interesting and successful meeting. It is earnestly desired that as many as possible be in attendance. Members of the profession are cordially invited.

FLORENCE S. GREEN,

Corresponding Secretary.

THE

International Dental Journal.

VOL. XXI.

JULY, 1900.

No. 7.

Original Communications.¹

HYPNOTIC SUGGESTION IN THE PRACTICE OF DENTISTRY.²

BY WALTER H. NEALL, D.D.S., PHILADELPHIA.

If a body of individuals, selected for a specific purpose, should isolate itself from the rest of the world, and each person in that body be imbued with the thought of the good and welfare of its members, yet in due course of time one of those persons would stand out pre-eminently, and would so fashion, control, or dominate the doings of the others that he would be recognized as the ruler, the guide of their common destiny.

Executive ability is the argument advanced for his success in this particular instance; the power of argument is another; the gift of speech-making still another. But it is a well-known fact, and it is a matter of recorded history, that men of exceptional executive ability do not control, men who are giants in argument do not lead, and men who could talk by the hour are not the foremost ones of government or the rulers of their fellow-men.

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the Academy of Stomatology, Philadelphia, February 27, 1900.

To what subtle influence, then, can one man's power over another be ascribed? Fear? That does not enter into the argument. Desire of peace and concord? They play but little part in the question. Personal appearance, then? What weight has this? A man may be repulsive both as to face and figure, he may be careless in attire, and he may not yield obedience to the niceties of polite society, and yet he will attract you, charm you, fascinate you, as it were. You hearken to his words with respect; the peculiar inflection of his voice holds you a close, attentive listener; you follow his actions, his gestures, unconsciously; the flash of his eye thrills you; you laugh when he is merry, you cry when he is sad; in truth, the individual magnetism, the indomitable will-force of such a person, pervades one's brain and sways it as the wind does the rushes.

It is not so much the words, it is not so much the actions, but it is that something, that individual something, emanating from that person and fastening itself upon your innermost soul. Nor is it an evidence of weakness upon the part of the one who yields to the subtle influence of another's power. Man is amenable to impressions; his faculties respond to various sensations. Harmony is conducive of quietness; it is sedative in its nature; whilst discord, on the contrary, frequently produces the most frightful anguish. Certain sights affect one in diverse ways. Even certain odors are potent factors in controlling the feelings of individuals. And thought sways man to the two extremes,—great felicity or abject despair. Man is therefore a creature of sensations or emotions, if you please. And there is no good reason to the contrary that if the emotions control man, man should not control the emotions. To a circumscribed extent he does, covering his own individuality, and by proper study and training he may further extend that power and exercise it over his fellow-beings.

This controlling influence of one individual over another may be aptly illustrated in the case of educational institutions in which the classes come under several instructors. These instructors may be possessed of equal ability as teachers, each be of good address, of even temper, and yet one will get out of his pupils all that is possible, will fashion the better scholar, will command obedience, and will govern without effort.

The secret is that invisible force, that unseeable thread, emanating from the teacher connecting in perfect harmony with the

brains of those under his care and guidance; a species of telepathy, as it were, in which the power—the teacher—is strong, stable, and of exceptional vigor, so that every station—the minds of the pupils—receives clear, sharp, and unmistakable impressions.

This sympathetic bond exists where teacher and pupil are face to face, are in actual contact; and yet this mind accord is also noticed when persons are in different localities, and those, sometimes, far removed. The thoughts dwell upon the absent one, and lo! that person suddenly presents himself. This is treated as a coincidence, and yet this so-called "coincidence" may be the result of the will-power of either or both of the individuals concerned.

Take the trite expression, "I feel it in my bones." A premonition that something was about to happen gave rise to its utterance. One is often seized with a nameless dread that disaster or sorrow will be their part before the day is over. This terror cannot be explained or accounted for, and yet it exists and frequently has its realization either in a calamity, a reverse, or news of a distressing or disturbing kind. This might be explained, in part, by stating that pre-existing facts or occurrences may have led up to this apprehension, this anticipation of misfortune or evil report. At any rate, "coming events cast their shadows before," and frequently the brain of man receives impressions or hints of forthcoming happenings of which by no possible combination of circumstances had any prior indications been presented.

This "mind accord," previously referred to, is further exemplified in that, should one enter a dark room, supposed to be empty, and a person be concealed there, that person's presence is conveyed to the other in some mysterious manner; in fact, that unknown presence seems to be felt.

With the knowledge that man does receive brain hints or intimations that something is about to transpire; that he is capable of training his personal will-power so as to make it subservient to his wishes; and, further, that he is enabled, in a measure, to sway the will of his fellow-man; and also when it is taken into consideration how easily mankind, under certain conditions, is prone to yield obedience to concentrated effort and superior brain-force, Hypnotic Suggestion in the Practice of Dentistry is one of interest and importance.

Hypnotism has become a valuable, a necessary adjunct to medicine. The French physicians have proceeded upon well-established

lished lines to prove its worth and efficacy. Their German brethren have investigated wisely and well. In fact, the medical world has begun to realize its claims and to regard it, not as a plaything, an interesting experiment, but rather as a valuable aid in the treatment of certain disorders or conditions. To put it quaintly, hypnotism might now be placed in the list of drugs as an opiate, a soporific, to be used with skill and circumspection.

In this connection the curious custom of the American Indian medicine man, in treating the sick of his tribe, is worthy of consideration. The hideous painted features, the fantastic garb, the discordant monotonous musical instruments, the peculiar droning song and the weird chanting of the sick one's relatives, are calculated to lull, to soothe the patient. That is the object of the treatment. And this being continued without cessation hour after hour, the sick one is really hypnotized to a certain extent. The medicine man's cure is more in the nature of hypnotic influence than of roots and herbs, although they play their part.

True hypnotism is a form of somnambulism artificially produced, in which the subject's every thought or action becomes subordinate to the will of the operator. In hypnotic suggestion the conditions are not carried to any such decisive point, the first stages simply being employed,—that is, quietness, amenability, and trust.

In this wonderful age, progression impels the dentist to treat the mental side of his patient, so far as controlling and suggesting goes, as well as the physical ailments to which his teeth may be subject, and this necessarily leads the dental practitioner into quite a new phase of dental ministration. A dentist of tact may succeed with his patients, but a dentist of tact, with the aid of hypnotic suggestion, will undoubtedly bring about the greater number of cures and successful operations. A positive man, though he be a skilful dentist, will not succeed when one considers the average; not unless back of his dogmatic nature he has the necessary amount of mind-strength or will-power to control his patients, thus enabling him to carry his ideas to a happy issue. Brute force wins but once, and the dentist without sufficient brain acumen to realize that something else than mere cold-blooded cutting, excavating, and plugging is looked for by a suffering public, will be speedily relegated to a limited circle of patients possessing steel nerves and cast-iron natures.

A dentist has a far loftier aim than to be simply an expert in handling the drill, bur, or filling-instrument. The field for research is large and is ready of exploration for him, and to his allotted work another course of careful study is presented. Not that the dentist should be an expert hypnotist, but rather that his mental force or caliber should be of a timbre calculated to influence, soothe, direct, and in a measure control; trained to produce such effects, if need be. Nor is it expected that live pulps can be removed without the patient experiencing distress, or an abscess be opened without pain, or a tooth be extracted minus the usual suffering, although, if the practice be carried far enough, these could be successfully accomplished.

The idea, briefly, is that the patient's thoughts and actions should be controlled to a certain point, rendering him obedient to the dentist's wishes, so that operations, from which one would shrink under ordinary circumstances, can be endured with fortitude and composure. This delectable condition may not be attributed, by the unthinking, to hypnotic influence or suggestion, but rather to the personal will-power of the operator. What is the personal will-power, then, of the operator? The will, first, is the self-consciousness of ability or strength to control or direct; the knowledge of mind-force greater than that upon which it is directed or exerted; secondly, it may be the realization of a power that is governing or guiding. The dentist, therefore, representing the first definition, is to exert his will-power, and in so doing he necessarily practises the rudimentary principles of hypnotism, and the patient,—definition second,—recognising a superior force or becoming subjective to the quieting influence of mind concentration, yields ready obedience.

In this concentration of mind-force there should be no hesitation or wavering, even for a moment. If intermitting, it is simply time spent for naught. It is the quiet, authoritative, self-reliant manner that controls, not the holsterous, nervously excitable, or hesitating.

If the patient has lack of confidence in the dentist's ability to cut, drill, excavate, and fill without producing pain, and is fearful to a distressing degree, the first step would be to remove that want of trust, after which comes the subjugation of the will. The latter is analogous, in a measure, to the efforts of a physician in administering an anæsthetic. There is some rebellion at first, but gradually

the patient succumbs, and eventually a passive, pliable subject is the result.

This hypnotic force or undue strength of the will may be natural or it may be acquired. If natural in its intensity, then the possessor is endowed with great power for good or evil; if dormant, it may be stimulated; if latent, it may be cultivated, to be directed into one of the two great channels enumerated.

A patient suffers more in anticipation, oft-times, than he does when actually seated in the dentist's chair. Instances of positive illness have been noted, superinduced by the very thought of a dental operation, and that of the most trivial character. When a patient of pronounced nervous idiosyncrasy presents himself, a course of preparatory treatment should be employed by the dental practitioner; not looking towards performing an immediate operation, but rather to gain an ascendancy or mastery over the other's will-power. Such a course would prolong the dental operation, no doubt, but it would invariably place the patient in a better condition pending the arrival of the crucial period. This controlling force or influence cannot be produced by hard, severe, or exhaustive manual toil: the day laborer is a fitting example. Neither do the works of fiction possess it, although the individuality of certain writers may dominate their books and, to a certain extent, lend dramatic force to their literary efforts.

The planning of an intricate machine, or of a colossal piece of architecture, and the execution of the same exert an influence only of admiration or praise. The newspapers present public sentiment and comment, and offer discussions pro and con, but they do not compel or force one to believe or even accept. The dentist at his chair, being an educated man, a close observer of human nature, and brought into such close relations with his patients, has an exceptional opportunity of producing or causing this sedative influence. Ofttimes the accomplishment of it is exhaustive. After operating upon a particularly stubborn patient, he will be utterly prostrated. This prostration will not be of the body, the fingers, or the hands, but of the *mind*. The nervous force, the vital energy, seems almost used up, and yet the body be without fatigue. In this instance the resisting power of the patient has not been conquered; the dentist has not proceeded upon the right lines. It is will against will, with a pitched battle as the result, an unsatisfactory operation, and quite probably a dissatisfied patient. The

moment the patient takes the chair the full influence of the dentist's governing power must be exerted; he must be master of the situation; resistance must be overcome and passiveness secured. If the conditions are not favorable at one sitting, then the postponement of the operation is indicated until they are.

Man's controlling ability may, very properly, be divided into four distinct classes:

Class 1.—*Simple suggestion* alone, without the coercion of will force or influence, one's credulity being worked upon without special effort of the operator, mere intimation and action being employed.

Class 2.—*Collective suggestive influence*, wherein the combined wills of a number of individuals, acting in concert, influence the will-power of a single one. It partakes, in a measure, of the previous class, only being carried farther in its performance.

Class 3.—*Hypnotic suggestion*, in which a person is influenced and controlled by the exertion of another's will-power *without* being placed in an hypnotic sleep.

Class 4.—*True hypnotism*, the subject coming wholly under the control of the operator and having no other thought than to do his bidding. In this class the subject has passed into the artificial slumber known as hypnotic sleep.

In the practice of dentistry, Class 2, *collective suggestive influence*, necessarily does not have a place, and Class 4, *true hypnotism*, with but few exceptions, has not been employed, although examples in each class make interesting studies. In Class 1 it will be observed that the imagination has much to do with the control of the subject's feelings and actions.

Example 1.—A woman of color presented herself at a dentist's office for tooth extraction. She insisted upon having some numbing fluid placed around the affected tooth, a molar. The operator, at that moment being without any such drug, substituted cold water, and, after plentifully rubbing it upon the gums, extracted the tooth. The patient insisted that she felt no pain, and that in the future all her teeth should be extracted by the same means.

Example 2.—An Irish woman visited a certain dental college for the purpose of having a carious tooth removed. She would not submit to the extraction unless gas was administered. The demonstrator in charge of that particular branch having departed for the day, a mischievous student suggested to his companions, unknown to the patient, a novel mode of performing the operation. He pro-

duced a foot-bellows with a long rubber hose attached, and, inserting an end of the latter into the patient's mouth, proceeded to fill her full of air. When the woman was almost on the point of strangulation the tooth was removed, *entirely without pain*, as she declared.

Example 3.—A gentleman, a man of learning, wished the extraction of a bothersome tooth by the aid of the chloride of ethyl spray, its working and effect having been explained to him. The dentist proceeded to use the same, when, to his consternation, he discovered that the tube would not spray at all, a few drops of the material merely falling upon the tongue. However, as the gentleman had opened his mouth so wide, and seemed so confident, and the tongue had received an impression that a paralyzing agent was being employed, the dentist decided to extract the tooth and explain the non-working of the spray afterwards. The tooth was removed, and, to the operator's surprise, the patient positively assured him that, "That was the easiest operation under which I ever sat; the chloride of ethyl spray is truly a wonderful product of modern dentistry." Needless to state that, to this day, the patient's mind has not been disabused of the part the imagination played in that particular tooth extraction.

Example 4.—A patient of unsound mind, accompanied by his attendant, complained of a hard substance being wedged in the crown of a certain tooth. A minute examination was made and nothing discovered, excepting that he possessed an unusually good set of teeth. The patient was not satisfied, and still persisted that a stone was lodged in one of his molars. The cue was sufficient. The operator sought his laboratory, and, securing a pebble such as is found in the sea-sand, another examination was made and the small stone eventually brought to light. Result, a pleased and relieved patient.

Example 5.—A patient presented herself to have an artificial plate eased. Whilst talking, the operator had merely wiped off the plate and then reinserted it, in order to ascertain the exact spot of undue pressure. The patient expressed her satisfaction at the immediate comfort given, and departed satisfied.

Example 6.—This also relates to an artificial denture. It had been complained of as being uncomfortable as well as cumbersome. In the dentist's estimation, it was an excellent fit and as light as it was possible to be made with strength and stability. He retired for a few minutes to his laboratory. The sounds of filing a piece of

vulcanite and the grinding of a porcelain cup reached the ears of the patient. On the plate being reinserted, the fit was accurate and the cumbersomeness had disappeared. *The plate had not been touched with file, scraper, or wheel in any particular.*

The foregoing examples relate to simple suggestive action, and *not* to the true influence of a stronger will. But they serve to show how easily one's reasoning power is disposed to receive, adapt, or adopt, if put into proper frame of mind for doing so. It is the first step leading to the true hypnosis,—the preparation of the mind, the directing of the thoughts into a certain channel, and the leading off from the thing at heart.

In Class 2 direct and concentrated means are employed. Example 1 presents a case wherein no previous studied attempt had been made to accomplish the result.

Example 1.—Subject, male, aged thirty; temperament, nervous; health, good. Mr. T. was one of thirty clerks employed in a large office in Philadelphia. Before his arrival, one morning, a fellow-clerk conceived the idea of a systematic remarking upon Mr. T.'s sickly appearance. When Mr. T. presented himself the plan was carried out, and each clerk had a quiet word of regret or commiseration for the victim. At twelve o'clock he went home ill, and spent several days in bed.

The remaining examples in this class relate to united and specially prepared effort. The manner of proceeding is easy of execution. A subject is selected at random and instructed to concentrate his mind wholly upon the success of the experiment. He is not to combat the will of the operator, nor is he to resist in any particular; he must be passive within the strict meaning of the word. He is then requested to retire from the room, and the audience is directed to conceal an article which he may be *willed* to find. Strict quietness is enjoined, with the further injunction that each person concentrate his or her mind upon the object hidden. The subject, blindfolded, is again brought into the room. The operator stands behind this person and places his thumbs at the base of his skull, with the fingers extending to and upon the temples; thus one line of mind communication has been established. The subject is directed to think of finding a certain secreted article, and to be governed entirely by the influence of his *mind impulses*; that is, when thus blindfolded and held, amid deep silence and intently thinking, after a few moments one seems to have an inordinate desire to

pitch forward or to either side. Immediately the impulse is felt, the subject must move in that direction. After this comes a period of rest, and then the impulse is experienced again, and thus intermittently continued until the concealed object is reached and brought to light. The operator gives no intimation of direction whatever. He simply presses his fingers and thumbs firmly upon the subject's head, keeps his thoughts upon the object to be found, his eyes riveted in that direction, and intensely *wills* that it *must* be discovered.

Example 1.—Mrs. S., aged thirty-eight; easy-going, pleasant nature; readily influenced by conditions. She proved an apt subject, and gave herself up entirely to the experiment. Result, hidden watches, handkerchiefs, and minor objects were quickly located and disclosed.

Example 2.—Mr. A., aged thirty; a broker; a doubter and a scoffer. In manner, brusque and of quick temper. He requested the experiment tried upon himself. He was accommodated only after he had promised to obey, strictly, the conditions exacted. He made two zigzag trips around the room and finally came to a standstill, with spasmodic twitchings, *upward*, of his head. Finally he pulled the bandage away from his eyes, declaring that "the whole thing was nonsensical." He was now in the middle of the room, having started from one end, directly under a large chandelier. He was requested to look above his head, and there, suspended from the central portion of the gas-fixture, was a handkerchief that he was requested to find. If he had obeyed the *mind impulse*, and had stretched his hand above him, undoubtedly he would have grasped the handkerchief.

In Class 3 four examples are presented, each of recent date.

Example 1.—Mrs. W., aged about forty years; of meagre physique, highly nervous, and of fluctuating will-force. She wanted six loose teeth extracted, but positively declared that anæsthetics would not be tolerated. In fact, she had decided that she would suffer until the offending members dropped out. The manner of procedure was as follows:

The operator placed himself in front of the patient and, intently gazing into her eyes, quietly suggested that the teeth could be removed readily and without hurt. She demurred and dropped her eyes. She was commanded to look the operator in the face, and again the intense, unwavering gaze was employed. The hands were

passed several times across the patient's forehead, and again the suggestion was made that the teeth could be quickly removed without the least suffering on her part. There was slight rebellion. The operator was determined that she *must* submit. On the assistant handing out the extracting forceps, the teeth speedily reposed in the napkin. She has since declared that she never knew how she ever had the courage to have those objectionable teeth out.

Example 2.—Master H., aged six; wilful and peevish. He came with his mother and nurse. Several teeth required filling. He would not open his mouth, was impudent to his parent, and repeatedly struck at the nurse. The mother was despatched on a shopping tour, and the nurse sent into the reception-room. Alone with Master H., the operator stood some distance from the patient and exercised the fixed gaze of the eye. Not a word was said for several moments. Then the lad was informed, in a decided manner, that the teeth were to be filled, and would be filled; that it was folly for him to struggle, and that he *must* obey the dentist's every wish. After repeated strokings of his forehead, and reassuring remarks, never once relaxing the intense gaze, the operation was begun and completed ere the return of the mother.

The boy was not scared or awed; he simply *knew* that he had to submit, and did so.

Example 3.—Miss S., not yet out of her teens. Teeth very sensitive, and she correspondingly nervous over the fact. It was impossible for her to sit still; the slightest touch caused her to crouch down in the chair, as well as to jerk her head away from the operator's hands. The same means were employed as in Example 1, only they were carried to a greater extent. She was directed to gaze intently at a bright disk of metal for a considerable time; then the eye concentration, after which the passes over the eyes, and the positive, decided manner of speaking. The result amply paid for the interval spent in preparing her for the ordeal of teeth filling.

Example 4.—Mr. R., aged probably fifty; a sallow, highly strung individual, gifted with the fault-finding propensity to a great degree. The sensitiveness of his teeth made this failing all the more glaring. After considerable exertion on the part of the operator, Mr. R. was subdued and became a passive, well-behaved patient, the prescribed lines, quoted in the previous examples, being followed out. At first he objected to the fixed gaze, but finally, at its being persisted in, he relaxed into silence and endured treatment.

from which he had frequently rebelled, and, on several occasions, deferred until another period.

In Class 4 three examples are given, showing how this class might be employed in operations of a minor character.

Example 1.—On several occasions, in a public hall, a master of the art of hypnotism placed a number of individuals in an hypnotic sleep, and whilst in that condition carious teeth were extracted by a dental practitioner, the patients being, to all intents and purposes, oblivious of the whole proceeding. In fact, not a moment of hesitation was noticed. The persons submitted to the extraction quietly and willingly, being under the impression that they were to enjoy sensations of a novel and pleasing character.

Example 2.—A young man of average intelligence, being placed in an hypnotic sleep by an experimenter in one of the institutions of learning in this city, pins, needles, etc., were used upon him without a tremor of his muscles. Afterwards he was informed that but one side of his body would be insensible to pain, whilst the other would remain normal. The idea was carried out. The young man felt no distress when needles, pins, and sharp-pointed knife-blades were thrust into his flesh upon the side purported to be senseless to pain, but invariably flinched and drew himself away when the normal side was even touched with the pricking instruments. He was put through other interesting tests, with happy results; that is, the operator's success with this subject was conclusive.

Example 3.—Miss W., aged eighteen; pupil of a seminary for young ladies; nervous temperament; bright, active, and vivacious; one of the guests at a summer boarding-house at which the writer was stopping. In this case several experiments in Class 2, collective suggestive influence, had been attempted, and were invariably highly successful, such as finding a handkerchief, a ring, a key, or picking out a certain person from the midst of the audience, some thirty in number. Evening after evening these trials were made with Miss W. as the particular subject. Finally it occurred to the writer, who was conducting the experiments, that if the young lady was so amenable to mind influence, why not carry the attempt to the true hypnotic period. This was proposed and explained to her, and with her consent the test was made, and from that time Miss W. was able to accomplish many astonishing feats at the will of the operator. She was an exceedingly impressionable subject.

For the benefit of the uninitiated, the *modus operandi* is given

in extenso. Miss W. was conducted to another apartment, usually by a committee of two. One person was generally selected by the audience and told to write any command or wish upon a piece of paper, said writing afterwards being seen only by the operator. The paper was then concealed. Absolute quietness was now requested, and Miss W. was brought back to the room. The operator looked her fixedly in the eyes and passed his hands lightly once or twice across her forehead. She was then blindfolded. The operator, with his fingers upon the pulse of her right wrist, said, impressively and authoritatively, "A certain thing is required of you to do. I am thinking of that thing. Go and do it."

With that she was released. There would be hesitation for a moment, but, being urged by the sharp command, "Do my bidding!" she would begin a rather uncertain tour of the room, amid profound silence, and when wavering in her movements, a quick injunction reassured her. At the completion of the experiments, the concealed paper always testified to the success of them.

Whilst they produced astonishment and entertainment for the audience, they seemed to afford the young lady in question a peculiar delight, for she invariably sought out the writer "to practise upon her," as she called it, whenever her friends made an evening visit. When asked what her sensations were, she replied, "None worth speaking of. I simply allow my mind to become a blank, if that is possible, and think of nothing but what I must do for Dr. Neill. I seem to be in a dazed condition, being vaguely compelled to do something about which I have a confused idea. After I am told to 'wake up,' I always have this nervous spell. I really do not mind it; it is a little exhausting, but the effects do not last long."

It would be absurd to declare that *every* person could be brought to the stage exemplified in Class 4. It would be simply impossible. But it is without fear of contradiction that the statement is made that almost every person can be brought to feel the influence of Class 3.

Class 1 is employed as a matter of course, often unconsciously so by the dentist, but when Class 3 is used, it is the result of intelligent study. A few hints as to practical work are apropos.

The subject being placed in an easy, comfortable position, a bright object—a highly polished metal disk, set in a rim of rubber, or a new silver coin—is held within eight or twelve inches of the eyes. The gaze is concentrated upon this bright object far from

fifteen to twenty minutes, with the mind dwelling only upon this one idea. At the expiration of the time an impressionable person will be in a fit condition to render ready obedience to an authoritative tone. Or, as has been suggested and used in France, several bright objects may be hung upon the ends of fine silken cords, and the whole made to swiftly revolve by aid of special mechanism. The subject keeps his eyes upon the scintillating circle for a given period, and a quiescent, obedient mind results. A number of persons have been so controlled at one time.

A Simple Lesson in Mind Concentration.—The learner, or beginner, is to fix his whole thought and attention upon the *back of the head* of a person *unconscious* of the other's presence. The opportunity for such an experiment is afforded at lecture, entertainment, or other public gathering. The novice fixes his earnest gaze upon the back of the head of a friend some seats in advance. He is to determine, to will, that the friend *must* be influenced, and *must* turn around and recognize him. By constant practice this becomes easy of accomplishment. In fact, being aware that some one has his *eyes upon you* is no new thought, but to systematically exercise one's brain in order to produce the effect may be new to many.

The next lesson deals simply with the idea of looking intently into the eyes of a person when talking, steadily, unwaveringly. The power of holding the eye without movement must be practised assiduously. Looking fixedly into one's own eyes in a looking-glass affords excellent opportunity for experiment.

After these lessons have been thoroughly mastered, the graver considerations of the other phases may be entered upon. The line of study for the dentist, in connection with hypnotic suggestion, is in the cultivation of a firm, clear gaze of the eye; an authoritative, positive way of expressing one's self; a determination to overcome resistance; a steady grasp upon one's temper; certain passes of the hand, which in some cases are indispensable; and the gaining of the subject's full confidence.

If these rules are well considered and carried into effect at the chair, the dentist will meet with greater success in difficult, trying operations than if they were ignored or regarded as being of no moment in the practice of dentistry.

THE ETIOLOGY OF PYORRHŒA ALVEOLARIS DISCOVERED SO STATED.

BY DR. E. F. ARRINGTON, GOLDSBORO, N. C.

THERE is recorded in the INTERNATIONAL DENTAL JOURNAL for July, 1899, a paper written by Dr. W. J. Younger, and read by him before The New York Institute of Stomatology, April 4, 1899, in which he represents to have discovered the true cause of pyorrhœa, and reported cases (very extreme) treated and cured.

Dr. Younger is a prominent member of the dental profession, and doubtless is competent for successful execution of work in general practice in which superior skill is requisite, and to make bacterial investigations to some extent. But in this instance he has erred and blundered badly (an occasional occurrence with the most skilful and scientific), and must of necessity do his work of investigation over, and make it more thorough, if he wishes to establish his theory as truth beyond questioning.

The doctor expresses his convictions very pointedly as to what he believes to be the true etiology of pyorrhœa, but unfortunately cannot and does not find the cause until the disease has played havoc with the soft tissues and alveolus, and has almost run its course.

In reading the paper it will present as evident to the mind of any dentist at all familiar with the disease in question and interested in investigations for cause that Dr. Younger's findings are out of place and are misleading. Work of investigation for cause of a local disease must commence at location of first perception, the beginning, and not at the winding-up or terminus of a disease in a distant location. The locality of commencement of disease must first be determined; then take it in its incipency, and follow its progress, and record carefully the varied features and changes for data and guidance.

In no disease is there better-defined features in the various stages of progress than in this disease, pyorrhœa alveolaris, so called.

I have long contended that the appellation *pyorrhœa alveolaris* was erroneous and misleading, and until discarded the disease would continue a mystery and a puzzle, and would not be diagnosed

readily in the early stages and treated as successfully as it should be. It is unquestionably a pericemental trouble, commencing at the gingival margin, varying in features during progress to destruction of alveolus and loss of teeth. A disease must not be diagnosed and named by symptoms and features that are never present except in the advanced stages, as is the case generally with this disease. The deposits on the roots of teeth, pus formation, and waste of the alveolar process are never perceptible until the disease has made considerable progress. Hence the absurdity of the name, pyorrhœa alveolaris.

There must be, and is, a beginning, starting-point, with ever-present diagnostic features, in this, as in all defined local diseases. With this fact established, there is no reason why we should wander about in investigating for cause or question as to the point first to be investigated and treatment to be applied.

The name *gingiva pericementitis*, which better defines, locates, and makes more explicit the disease in its incipiency and early stages, would, I think, more correctly guide us. At the early stage of the disease, when it is just perceptible at the margin of the gum, it is definitely outlined with diagnostic marks, and is as distinctly a disease as when further advanced, and as many other diseases. The symptoms following in course of progress, deposits, pus formation, waste of membrane around the roots, and waste of alveolar process, are but sequences to be looked for if the disease is neglected.

In the advanced stage of every well-defined case of *gingiva pericementitis* deposits on roots of teeth and pyorrhœa will be recognized; they are never-failing features, and to effect a cure (treatment speedy or prolonged) without effectively removing the deposits is impossible. The removal must be accomplished with suitably shaped, *smooth* edge scalers. The application of acids to soften deposits is useless, as none so far has proved effective.

If treatment is commenced in the early stages, there will be neither deposits nor pus (pyorrhœa) to contend with, and cure can be easily effected.

The chief error committed by Dr. Younger in his work of investigation for cause of the disease consists in his beginning with the disease in the advanced stages, with the consequent symptoms, and not with the disease in its incipiency.

If a "specific bacillus" is the true cause of the disease, as stated by Dr. Younger, it certainly ought to be found and located at the

gingival margin, the locality where the disease (not pyorrhœa) first makes its appearance.

Dr. Younger says, "What I personally consider pyorrhœa to be. It is characterized by an inflammation of the gums, a deposit of characteristic greenish-gray or slate-colored tartar, and wasting of the alveoli, accompanied by the formation of pus and pus pockets between the tooth and alveolus; the disease being due, as I believe, to a specific bacillus;" and says, "The cause of the deposits around the teeth is due to the presence of bacteria;" also, that "in the pus taken from the deep parts, the location where the active destruction of the alveoli is going on, numerous bacteria are found." Then he says, "Enough has been learned to satisfy us in this, at least: That we have a distinct, specific bacillus found in these true cases of pyorrhœa that is found only in those diseased portions which are not contaminated by septic material; in other words, it is, in my opinion, one of the normal bacteria of the mouth, rendered virulent through some agency which is not yet determined." He further says, "This bacillus is not found along the alveolar edge of the tooth; it is not found in the collections of tartar along the gingival margin; it is found only in the deep-seated pockets where the advance guard of the disease is progressing."

If this bacillus, of which Dr. Younger has written, is truly what he says he believes it to be,—one of the normal bacteria of the mouth,—how can it be a specific bacillus, and the cause of the disease? If the cause in question, it ought to be found along the alveolar edge and in the deposits along the gingival margins, and not only in the deep-seated pockets, for at the margins the disease commences, and the deposits along the gingival margins are the same in quality as those located lower down or farther up towards the apex of the roots.

If the doctor will renew and continue his investigations for more definite and convincing results, I think it more than probable he will view the subject differently, and will proclaim conviction that the "specific bacillus" of which he has written and represents to be the true cause of disease is nothing more nor less than normal bacteria much improved, developed, and vivified by migration and a plentiful supply of good nourishment, favorable to growth and action of bacilli, a consequence and not a cause. Such would be a reasonable conclusion, at least, until there can be produced some evidence of their presence at the gingival margin.

Ordinarily it is wisest and best not to herald a new theory, or discovery involving minute scientific work, until facts are established beyond a question of doubt; then no one would be led astray, and there would be less room or cause for questioning and controversy, and facts revealed through scientific investigation would be more universally acceptable, and progress would develop more rapidly.

Scientific investigations are daily developing to our minds new lights, beauties, and wonders. Developments most surprising and startling may, must be anticipated, and as science reveals and *establishes* new truths, we must accept and profit by them. But we must be cautious, and not hastily jump at or accept conclusions, nor take for granted that every new theory advanced and proclaimed to be evolved through *scientific* investigation is truth beyond questioning, for we have, to the contrary, too many evidences of error. Whenever there is evidence of inconsistencies and lack of thoroughness in the handling and presentation of any subject, there is just cause for questioning, and the sooner it begins the better for science and all concerned.

A knowledge of the true cause of gingiva pericementitis—pyorrhœa, if preferred—is desirable, and may possibly be revealed to us in course of time; so far it has not been. Yet we can diagnose the disease correctly, and treat successfully, by making it a point to begin at the beginning.

In reading Dr. Younger's paper, any one would reasonably infer that he deals with the disease in the chronic stage altogether. He says, "The treatment of pyorrhœa involves, first, the removal of every particle of the deposit; secondly, the maintenance of the tooth in rigid position while the process of repair around the root is going on; in other words, until the complete proliferation, attachment, and thorough organization of tissue has been established; and, thirdly, the restoration of attachment between the soft tissues of the alveolus and the root." He cites a case treated and cured after all the teeth had lost more than two-thirds of their alveolar support, and teeth "leaned in all directions, simply being held by their apical attachment." Also another case in which "all the upper incisors projected more than half their length from their sockets, retained only by apical attachment." These certainly were very extreme cases, and cures effected under such circumstances would evidence a feature of skill greatly to be admired and

commended, and we will not doubt but that Dr. Younger could prove equal to such a task, but in this instance he failed. The doctor, like most of us, sometimes miscalculates, and through zeal and desire to effect a cure pronounces a cure before cure is complete, as is plainly evidenced in the case recited, in which there was so much loss of the alveolar process. The doctor says, "I had cured this gentleman of pyorrhea, but his lower teeth were still in the embrace of ligatures waiting for them to become rigid, when he suffered from an attack of asthma complicated with other organic disturbances," when one day the patient called and wished him to look and see what had happened. He looked, and to his surprise he found an ugly state of things; treatment had to be renewed and continued for some time. The facts as stated by the doctor are proof positive that he was over-sanguine, and supposed a cure effected when it was not a cure. Had the cure been complete, as he imagined, there could not have occurred such a state of things in so brief a period; evidently it was a case of dismissal of patient before cure was complete, not an infrequent occurrence in practice,—none of us are exempt.

A cure is a cure, and, when definitely established, a case of asthma with other complications cannot in any way bring about or cause return of the disease. I think the doctor will so decide if he will carefully consider the nature of the disease.

The expression "apical attachment" is very indefinite, but my estimate of it is that when a tooth is held in place by such delicate support, immediate extraction is safest and best practice, for the chances of restoration to firmness in sockets through any line of treatment are very limited. A loosened tooth may be indefinitely retained in the mouth, but it is never advisable.

As regards the case reported, of incisors "projecting more than half their length from their sockets," it was a strange freak, certainly not a frequent occurrence with the disease. During many years' practice in treatment of the disease I have witnessed no such feature. The question arises, What became of the vacuums created by the protrusion of the roots from their sockets? Here is great room for surmising and speculation, but to shorten the matter, and for enlightenment without effort to obtain by investigation, we will ask that the doctor explain, as he restored the teeth to their sockets and left them with surrounding tissues in a healthy condition. We will not question the correctness of the doctor's report,

but it is permissible and reasonable to presume the teeth would not long remain as replaced; nature's laws and the nature of this disease would combine against such a result.

This is a disease of frequent occurrence, but not so frequent as Dr. Younger represents. He says, "At least ninety per cent. of the population suffer with some form of the disease." Therein the doctor commits a blunder (many do). There is but *one form* of the disease, but there are sundry features that present as the disease progresses. I speak pointedly and positively on this subject, for such are my convictions, established through practice and watchful observation, and I feel assured that investigation and time will confirm the verity of my assertions. The percentage of cases of this disease in proportion to population is large, but nine per cent. in place of ninety would be a liberal estimate. All classes and grades of society are subject to it, and it seems to be on the increase, and is more common in remote rural sections and with the poorer and neglected classes in towns and cities than with the higher and better-to-do grades of society,—the cause evident upon reflection.

It is not dependent upon any particular state of the system for origin, for all alike, the robust and the feeble, seem to be equally subject to it; nor is it a consequence or in any way complicated with any other disease. It is independent, distinct, and well defined, always first perceptible at the margin of the gums, develops more and more plainly, with diagnostic features, and progresses (let the general state of the system be what it may) stage by stage, with features never varying, developing until it abates with destruction of the alveolar process and loss of teeth.

It is amenable to treatment, and a large percentage of cases can be cured if treatment is not too long delayed. In the early stages of the disease the treatment is simple, and need not be of long duration. In cases well advanced, deposits on roots and teeth loose, the first thing requisite is to determine the extent of waste of the alveolar process and the strength of teeth in sockets. In a majority of cases, when teeth are much loose and have lost more than two-thirds of the alveolar support, immediate extraction I have found to be wisest and best practice; also the extraction of all diseased and non-useful roots. This procedure is justified and advised, based upon the fact that the restoration of alveolar process when destroyed by this disease never can be effected for the support of teeth; and for another fact, that loosened teeth and diseased roots

had better be out of the mouth than in, as such are always hurtful to health to some extent.

I have thoroughly tested the merits of lactic acid in the treatment of this disease, but have not been able to obtain such results as reported by Dr. Younger.

My experience in the use of sulphuric acid justifies me in saying that a very large percentage of cases can be cured within two weeks, a small percentage will require longer time, say from three to four weeks, a smaller percentage still cannot be cured by treatment, and the only remedy for relief is extraction.

I do not longer attempt to restore alveolar process, nor do I try to effect union of alveolar tissues with roots of teeth denuded of natural membrane by this disease. My efforts in that direction have proved a complete failure. I am thoroughly convinced that the most that can be accomplished by any process of treatment is to check the disease and establish a healthy state of osseous and soft tissues, and to so tone up and strengthen the gums as to effect a close fit to the roots of teeth, and by persistent, regular use of tooth-brush and moderate finger-pressure on gums as needed, and occasional application of a suitable tonic and astringent mouth-wash, to effect continued close proximity of soft tissues to roots to prevent ingress of particles of food during process of mastication. This, in my judgment, is the extent of possibilities of accomplishment by treatment in the advanced stages of the disease. It is needless and unwise for us to profess to be able to accomplish more in treatment of disease than is reasonable and possible. There is a limit to possibilities, and a line beyond which we cannot presume to venture with safety to the credit of the profession.

Further detail concerning this disease, as to treatment or otherwise, would make this paper too lengthy. But before closing I will mention for consideration several special features.

The disease never extends beyond definitely defined limits. The usual pain and discomfort attending abnormal conditions of the soft tissues of the mouth are but slightly conspicuous (sometimes not at all) with this disease.

Occlusion of the jaws with firmest pressure during process of mastication seldom causes a feeling of discomfort. A person is often troubled with the disease to the extent of deposit on roots and pus formation, and are not aware from any feeling of discomfort that the mouth is not in a healthy condition.

Pus follows deposits, and never ceases so long as deposits are adherent to roots. The deposits never attach except to the cementum. Enamel and smooth dentine are exempt. Ordinary tartar will, often does, adhere to the deposit peculiar to this disease, but the deposit of the disease never forms and adheres to ordinary tartar. The application of acids to soften the deposit is non-effective. No acid known will accomplish such a result in the mouth.

Some persons pass through life troubled with this disease for thirty or forty years, sustaining loss of many teeth, with freedom from any type of indigestion, and all the while enjoying comparatively good health. Others suffer in health until this disease is treated and cured, after which, improvement of general health is perceptible.

The disease seldom, if ever, commences after the age of forty. I feel confident I have never seen a case in its incipency after that age.

When all other remedies fail to cure, much may be accomplished by judicious use of sulphuric acid.

DENTAL EDUCATION.¹

BY DR. EUGENE S. TALBOT, CHICAGO, ILL.

MR. PRESIDENT AND MEMBERS OF THE AMERICAN ACADEMY OF DENTAL SCIENCE,—I am sure you will agree that it is high time that dental education was placed upon a broader basis than now exists. It is admitted that, when the brain is concentrated upon one department of science and severed from others, it is narrowed and the important matters are neglected. This is true particularly of dentistry. The establishment of distinct dental colleges in 1840 began the narrowing of our calling. From year to year this narrowing has been going on until, to-day, we do not know whether we are a trade or a profession. Students in dental colleges look upon anatomy, physiology, materia medica, and chemistry as fads distinct from filling cavities of the teeth and crown- and bridge-work,

¹ Read before the American Academy of Dental Science, April 4, 1900.

the central notions taught in dental colleges. The tendency to narrow specialism is strong, and, together with commercialism, narrows the profession from year to year.

The National School of Technique is the last straw upon the breaking camel's back. The central idea of preparation of cavities and filling teeth has been pushed to its extreme limit. "Measurement of cavities" and cutting away hard, sound, healthy tissue on approximal surfaces, while neglecting to remove the cause of decay, is, essentially, removing arm or leg because finger or toe is diseased.

A bill is now before Congress for the appointment of dentists in the army and the navy. Should this bill become a law, what dentist would be qualified to go to the Philippines and cope with the diseases of the mouth and jaws from which the soldiers are now suffering? To be sure, he could measure cavities, cut away good, sound tissue, and fill teeth; but what scientific status could such a man have?

Dental literature and dental societies of to-day exhibit marked evidences of lack of broad scientific principles. The jaws and teeth are intimately related parts of the general organism. Diseases which affect the body or an organ also affect the jaws and teeth, and decayed teeth and diseases of the jaws affect the general economy as a whole. With all the skill of dental mechanics, dentists are unable to arrest decay, nor will they be by the present methods of practice. Decay of the teeth is ever on the increase. Departments of medicine have already taken steps to inquire into the cause.

Interstitial gingivitis, or so-called pyorrhea alveolaris, is more to be dreaded than decay of the teeth. Since eighty per cent. of this disease is due to systemic causes which cannot be reached by local treatment, it is no wonder that the profession are at sea as to causes and ultimate results.

The first paper upon irregularities of the tooth was written in the year 1796, yet one hundred and four years after, a professor in two dental colleges claims that it is a subject for to-morrow rather than to-day. Another professor indulges in the charlatan-like cant that it is enough for him to know how to treat the deformity, and he cares nothing for the cause. Enough, however, has been said to show that broader medical training is necessary if patients are to be treated in an intelligent manner.

There was *once* a field for narrow dental-college teaching. Such

teaching in its narrow limits, however, soon becomes deteriorating. The tendency to overtreat and overdo certain operations is now well established. Two decades ago I expressed the opinion, to which I still more emphatically adhere, that if progress was to be made in dentistry, it must be along the lines of a broad medical education.

The country is full of inferior dental colleges graduating students unfitted for practice. Better schools are kept at a lower level by the National Board of Dental Faculties because of these schools. Why such universities as Harvard, University of Pennsylvania, University of Michigan, Northwestern University, and others standing high in educational matters otherwise, allow the dental departments to fall so low is beyond my conjecture.

"The government of Belgium is considering a bill advanced by the majority of physicians to suppress the diploma of dentistry and only allow the practice of dentistry to qualified physicians as a branch of the medical sciences, like laryngology, ophthalmology, etc. Beco, the chairman of the special committee, enumerates, among the reasons for this step, the overcrowding of the medical profession and the necessity for considering dentistry as an important and lucrative specialty in the domain of general medicine. The standard that has hitherto been required of dentists has been so low that some change is imperative, and suppression of special diplomas to dentists seems the simplest and most practical solution of the question under the present circumstances."¹

"A memorial has been presented to the Board of Management of the London Hospital, signed by about four-and-twenty gentlemen who hold, or have held, the office of dental surgeon to metropolitan general hospitals, urging that all candidates for these appointments should be required to be registered both upon the Medical and Dental Registers. There seems to be several good reasons why such a course should be adopted; hospitals require of their surgeons the possession of the Fellowship (which is, as a matter of fact, possessed by several of the dental surgeons), and there seems no reason why, in the case of a dental surgeon, they should be content with the license in dental surgery, which is the minimum qualification which entitles a man to practise dentistry. Then, again, he is concerned much more with the teaching of medical than of dental students, and he will not alone be in a better posi-

¹ Journal of the American Medical Association, February 17, 1900.

tion to avail himself of cases which lie on the border between surgery and dentistry, but he will teach with more authority and influence if he be qualified in medicine and surgery. The memorial, therefore, appears to be well timed and its arguments well grounded. It will, without doubt, have much weight with the body to which it is addressed."¹

Dr. E. A. Bogue informs me that to practise dentistry in Austria one must be a graduate of medicine.

It will be seen, therefore, that there is a general feeling that the dentist should be medically educated. There are many professors and teachers, even in our university dental departments, who say that they do not believe that it is necessary for the dentist to be medically educated to practise his profession. This feeling, no doubt, is due to the fact that they have been educated along these narrow lines. Their lack of knowledge of general pathology demonstrated by their writings is a standing witness of this deficiency.

When the subject of a medical education is suggested for dentists, the old hackneyed reply is always made that too much time and money are required for the dentist to take both a medical and a dental course. Lately it has been claimed, moreover, that lengthening of the medical course of study and the necessary laboratory work make it impossible for the dentist to cover both medicine and dentistry.

Dr. N. S. Davis, the father of the American Medical Association, president of the Ninth International Medical Congress, settled these questions more than three decades ago. In responding to the sentiment offered by Dr. C. W. Spaulding, then president of the American Dental Association,—“To the president of the American Medical Association; Medicine, Surgery, and Dentistry, departments of a common science; their disciples should constitute a common brotherhood,”² he went over the entire field, and showed that dentistry was as much a part of general medicine as ophthalmology, otology, etc., and that dentistry should be studied as a part of general medicine. His idea was at that time, and is to-day, that all students should matriculate in the medical department and study the general branches of medicine together for a certain number of years, after which the students should take up the hospital and

¹ *British Medical Journal*, January 9, 1900.

² *Chicago Medical Examiner*, September, 1865, page 276.

laboratory work which fits them for the special department of medicine which they expect to follow. The plan is perfectly simple, possible, and the expense to the university is greatly diminished. The details, of course, must be worked out by the universities. President Eliot has suggested a similar plan, which will cover all the difficulties that stand in the way of broad medical training,—that of a “university of medicine which shall teach all that has to do with animal life in health and sickness.” When this is accomplished, dentistry, with its almost perfect mechanical skill, will scientifically equal any other department of medicine. Presidents and boards of regents of universities having dental departments should nourish and strengthen this youngest and most feeble offspring of medicine until it is as robust as the other departments. When this is accomplished, scientists, medical men, and dentists abroad will look upon American dentistry as a science.

A NEW METHOD OF INVITING SLEEP WITHOUT DRUGS.¹

BY DR. J. B. LEARNED, NORTHAMPTON, MASS.

MR. CHAIRMAN AND GENTLEMEN,—I am conscious of the honor as well as the responsibility of appearing before you on this occasion. Your representative has asked me to tell you how to go to sleep.

In 1880 a severe injury to the brain and nervous system came to me, and for many years following it seemed to be necessary for me to learn how to go to sleep. I had become convinced that the effects of hypnotic drug-taking were more damaging than sleeplessness left to itself. After many years' experimenting, I became convinced that we could command the conditions, so to speak, in bed as readily as can the soldier and the huntsman prepare an appetite for a dinner. When I used the muscles sufficiently through the day, sleep came readily on retiring; but this was not always the case, and on going to bed I found I was not sufficiently prepared by being “all-round” tired. When I needed muscular exercise, and

¹ Read before The New York Institute of Stomatology, March 6, 1900.

went to the basement and ran a wood-saw long enough, I could return and readily go to sleep. Gymnastics in the bath-room, with hot and cold water adjuncts, served me a good purpose also. A walk of two or three miles around the square and back had the same effect. I felt tired then, and was ready for sleep.

This mode of preparation, however, has some unattractive features. Dressing and undressing in the middle of the night is one of them. It occurred to me here, under these circumstances, that muscular effort might be employed while in my ordinary recumbent position in the bed. I had found sometimes that the tired sense experienced while engaged in wood-sawing or walking disappeared when I was again in my bed, and the sleepless condition reappeared.

What are the obstructions in the way of sleep when we fail to reach it promptly on retiring? I have no time to talk upon remote causes. Civilization, tea, coffee, tobacco, the modern cook-book, and the drug habit, all potent factors in preparing the foundations for insomnia, I omit. I am to deal with the one obstacle which the brain-worker has to meet immediately on retiring, or at three or four o'clock in the morning,—*viz.*, automatic thinking. Without attempting to quote authority, I will say the brain is a great workshop, with machines, shafts, pulleys, and belts. The work of the brain is thinking. The power is fresh arterial blood. The immediate obstacle to sleep seems to be automatic thinking. Power being furnished, some belt is on, and one of the many nerve-centres persists in operating after work-hours. Now, since the machine always stops when the power is shut off securely, if we turn off the belt the thinking would stop and sleep come. Without going into the details of giving you the thousand and one contractions and relaxations I have made use of for the purpose of drawing the blood from the head, let me outline a few of the simple motionless and invisible exercises that serve generally a very good purpose. Let us take the respiration in hand.

Ordinarily the number of inspirations and expirations are twelve or fifteen. Reduce this number to four or six, making each inspiration full, regular, deep, prolonged; and let the expirations be carried on in the same manner. Thus the will-power is employed, and the muscles and respirations are called upon to an unusual extent. A part of the power that was used in the brain to carry on automatic thinking has now been turned into new cham-

nels. Keep this new mode of respiration under control, after the manner just described, for a few minutes, and the chances are more than equal that an equilibrium has already been established in the circulation, and that the automatic process in the brain has been checked. As soon as this is done sleep comes.

Take another exercise: Immediately upon going to your bed measure your length by reaching for the footboard and the headboard at the same time. In doing this you are exercising a large number of the trunk muscles and the muscles of the extremities. Hold this position for a length of time, until a sense of fatigue comes to the muscles engaged, and sleep may follow. Both these exercises may be carried on at the same time,—controlling the respirations and elongating the body to its utmost by trying to touch the headboard with the head and the footboard with the feet.

Here is another exercise: Remove the pillow for the time being. Lift the head a half-inch from its resting-place; hold it there, lying upon the back, until the muscles become weary; it will take but a very short time. Drop the head now, retaining the same position in bed, and raise the right foot a half-inch from its resting-place. You have now to hold the weight of the clothes and weight of the foot. The sense of fatigue soon comes to these muscles. Drop this foot and elevate the other in like manner. Hold for the same length of time, until the sense of fatigue is here manifested. Return the foot to its place. If you keep the regularity of respirations during these exercises of head and foot elevation under the constant watchfulness of the will, you have drawn upon the reservoir of power by calling blood to other muscles used, and you have relieved the parts of the brain having an over-supply, which caused the automatic activity.

Still another group of muscles may be brought into use by turning upon the side, lifting the head by the use now of a new set of muscles, hold until, as before, your sensation says “enough,” then let the head go down. Remaining on the same side lift the limb enough to sense the weight of the clothes as before, and hold until the call comes to go down, which you will obey without prolonged exertion. Turn now onto the opposite side, lift the head as before, use the opposite set of muscles, remaining for the same length of time to change as before the limb that is now uppermost. Hold still again the limb with its covering as before, until fatigue warns you to drop it.

Still another exercise, which may be engaged in with the same quiet and almost invisible results: Extend your arms by your sides, as though you would reach for the same footboard as before; contract every muscle in the arms; hold as before until the sense of fatigue warns you to change. Every muscle that has been used in these exercises has required the same power that has been in use without our consent or permission to carry on the automatic thinking of the brain. Bringing into use thus the muscles of all parts of the body, we have called power away from the over-supplied brain. Our method might be termed that of counterirritation. These exercises act as mustard-plasters to draw blood to one part and relieve over-distention in another part.

Now, it must be borne in mind that this mode of walking round the square, sawing wood with a dull saw, taking hot and cold baths, going through with a variety of gymnastic exercises at the open window, has been duplicated by the exercises we have gone through with in bed without dressing or undressing. Let it be borne in mind also that the one aim has been to take away power from that part of the brain whose juvenile pranks have disturbed us for so many nights and to transfer it to other parts. In other words, we have been turning off belts from one shaft and turning on belts to other shafts in this great machine-shop.

If the exercises be moderate that I have outlined, no addition has been made to the heart-beats. If persisted in with much exertion, the heart-beat will be accelerated as it would be by running instead of walking; as it would be by sawing a half-cord of wood in an hour instead of in two hours. Each individual is a law to himself here as elsewhere. The exercises which will fit one case do not so readily fit another, and the amount of exertion which one person can make and endure might be altogether too much for another person. So the very moderate efforts which I have outlined, always stopping at the first sensation of fatigue, might be entirely insufficient for some people. The robust, stalwart, vigorous brain-worker, who has allowed his muscles during the day to lie dormant, may well undergo more severe trial than the more slender, more nervous, and more broken man of mature years. Here let me say the condition of the heart, the condition of the lungs, the condition of the nerve-centres, of the digestive organs, and of the general nutrition are all factors in determining just what is best for each individual, not only in his day's work, but in the extemporised exercises

which I have just outlined to you. Do not overdo it. Heart failure appears as the cause of sudden exit in altogether too many cases.

I hope no one of you will furnish a reporter, to-morrow morning, the opportunity to say that heart-failure was the cause of his departure; and that the cause was the trial of the new method of inviting sleep without drugs. You can obviate this. Let your family physician listen to your heart; examine the molecular condition of your nerve-centres and the normal capacity of your lung-power.

A RESPONSE TO THE TOAST "DENTISTRY."¹

BY DR. C. C. BARKER, MERIDEN, CONN.

I HAVE no desire, or even inclination, to claim anything for dentistry which does not rightfully belong to it.

I hold now, and always have held, that every vocation which has for its object true service in answer to the legitimate needs of humanity is honorable, and has claims of its own for proper consideration.

No argument is necessary to prove the need of dental service; and if the rank of dentistry among the numberless vocations is to be determined by the character of the service required, and the ability to render that service,—and, pray tell me, what other way to fix the dignity and grade of any calling can be worth mentioning but this,—then the proper practice of dentistry is no ordinary matter.

The character of dental service the world needs and requires cannot be fully stated within the compass of a few short sentences. (I am speaking only in outline to-night.)

If I were to speak upon this subject at length, I should dwell upon the purpose and priceless value of the dental organs. We have to set ourselves a-thinking to properly realize all this.

A person with a thoroughly sound set of teeth and a healthy mouth has an endowment—a working capital—of incalculable worth. Perfect teeth are a prime factor in good digestion; there

¹ Read at the fourth annual dinner of the Hartford Dental Society, March 31, 1900.

cannot be good health without good digestion, and without good health we cannot realize the full measure of our abilities as we attempt to solve the problems of life.

The perfect teeth are, however, very rare; the vast majority are victims of dental decay, and, unaided by dental service, are doomed to—— Well, it is not necessary that I present you dental gentlemen with a detailed list of the troubles which so often accompany and follow the lesion and breaking down of tooth tissues.

The first experience generally is that peculiar and trying pain which Bobbie Burns called "The hell o' a' diseases!"

And the curse of Caliban, who wished that "All the infections that the sun sucks up from bogs, fens, flats, on Prosper fall and make him by inch meal a disease!"

Caliban's curse seems only a mere trifle when we think of the abscesses, the necroses, the facial deformities, the neuralgias, the dyspepsias, and the various abnormal systemic conditions which can be traced to dental caries for their beginning. As one eminent writer has said, "Indigestion, largely induced by imperfect mastication, is the prevailing malady of civilized life, probably the occasion of more disorders than can be traced to any other cause."

The character of the service required is the arrest of decay and the preservation of the teeth for the exercise of their invaluable functions; or, if past remedy, their removal and artificial substitution. This is the mission and service of dentistry. And were we able to compass in our thought what this all means,—the prolonging of human life, the comfort and happiness of mankind,—we should conclude as never before that the mission of the dentist is really a beneficence and a blessing. But this is not all we are to think of; the teeth have other functions which should be remembered. "Without their assistance in vocalization, distinctness of utterance in either speech or song is impossible. And what other features combined can confer so much of beauty upon the human face as a fine set of teeth?" Nothing so surely mars manly beauty or female loveliness as a blight here. How delicately Tom Moore speaks of the lack:

"What pity! blooming girl,
That lips so ready for a lover
Should not beneath their ruby rasket cover
One tooth of pearl!
But, like a rose beside the church-yard stone,
Be doom'd to blush o'er many a mouldering bone."

When we think of what dentistry may and does accomplish, we can also see that to this our chosen calling belongs the patent of true nobility.

This then—in brief statement—is the character of the service required and administered by capable practitioners of dentistry.

Now let us think of the ability requisite to properly render this service. Not every person can become a capable dentist. I do not know of any vocation which demands in its practitioners such varied and peculiar endowments—both natural and acquired—as does dentistry. Our esteemed colaborer, Dr. Crouse, of Chicago, editor of the *Dental Digest*, speaking of desirable qualifications in a dentist, said, “Is it too much to say that he needs all the logic of a lawyer, the scientific knowledge of the physician, and the high moral ideas and sense of responsibility of the clergyman combined?”

Dr. Crouse, as those of you who know him will say, is full of enthusiasm. Yes, and a reasonable amount of sensible enthusiasm is a good thing to have in any business. “Is it too much to say?” It is a large measure of ability, but it is not, after all, a full statement of requirement.

It must be confessed that people come to us not because they are altogether fond of our attention, but somewhat as a choice between two evils, and they are often in a very unwilling frame of mind. Here is where we have to apply the logic of the lawyer; not exactly in the mandatory sense, but by reasoning and persuasion. To do this well there must be a good knowledge of human nature, tact, and self-control.

How can a man take an instrument and safely and properly proceed to operate upon a person who has yielded confidence and placed himself under the dentist's hand, unless this dentist possesses an accurate knowledge of the tissues of the human system,—the bone, the muscle, arteries, capillaries, veins, nerves, the physiological functions of the various organs, their inter-relation, and the laws which govern vital action? And the dentist, as the physician, must know pathology, and be able to recognize the various expressions of disease. Therapeutics must be a part of his equipment, and his materia medica must be at hand.

The fact is, the practice of dentistry lies within the realm of medicine. This may be disputed and denied, but the fact remains, nevertheless.

There is another special endowment which is not really necessary to the general physician, which the surgeon needs in quite a measure, but without which the dentist can never hope to succeed; this is mechanical skill, and it must be possessed in high degree.

There is so much to be said along these lines, it is difficult to abridge. There must also be a knowledge of the materials employed, of metallurgy, and a good bit of chemistry. And withal, the dentist should be an artist.

When thus equipped, under what conditions does he perform his service? Under a stress of circumstance the like of which surround no other vocation. Within the very mouths of people which involuntarily resist intrusion, among tell-tale and protesting nerves, which scarce need to send telegrams the little way up to headquarters, for the two eyes are trained upon us all the while, and some of our patients possess very peculiar idiosyncrasies. But I will not dwell upon these features, except to say that dental operations must be performed under the stress of very adverse conditions, and well done, else they had better not be done at all.

There must be honor and integrity on the part of the operator; and to skilfully and faithfully perform these duties day after day and year after year, requires great powers of endurance.

If the rank of a vocation is to be fixed by the character of its service and the ability to render it, then there can be no doubt of the high professional status of dentistry.

It is "an occupation which involves a liberal education," and also that of a special sort.

Correct standards in dental practice are quickly recognized and sought after by broad-minded practitioners; and such men most naturally seek fellowship and association with others like themselves. It was this spirit, this touch of nature, this kinship, which prompted the formation of the first dental society; and it is the same spirit which finds illustration in this very pleasant and profitable gathering to-night.

Dental history, both written and unwritten, bears ample testimony that inscribed upon the honor-roll Hartford has had, and still has, a goodly number of bright and shining names: And Hartford seems determined to lead the van; for it must be said to your credit that your society is, so far as we are able to learn and to discover, the first to equip and maintain a permanent headquarters—a meeting-place—in one of the best of modern buildings.

accessible always to every member, where the current literature of the profession is at hand, and opportunity for interchange of thought, free from the interruptions and routine of the practitioner's office.

Let it be remembered—never to be forgotten—that our associations—national, State, and local—have been, and still are, the conservators of all true progress.

It is their influence which has constantly been raising dentistry to higher levels, and has made of it what we see to-day. And this has been accomplished in spite of many discouragements and adverse tides. Every profession and vocation, so far as I know, is disgraced by a class possessed of moral obliquity who, while they wear the name, degrade and debase their calling, sometimes by sheer incapacity, or, what is quite as bad, perhaps worse, an abandonment of all principle, careless of all standards of equity, seeking only pelf and plunder. There is only one name that fits them,—I call them *pirates*.

What the future has in store for our profession I cannot exactly say. I am neither an optimist nor a pessimist. We are in a transition period; the adjustments are not altogether certain either way. But of this I feel sure, that when dangers threaten and storms beat and lower, the maintenance of correct standards by the sturdy, steadfast members of our societies throughout the land shall be our safeguard, our sheet-anchor; else shall dentistry, without chart, rudder, or compass, float and toss and drift hither and thither—a derelict, a tramp—on the wide, wild waste of waters, liable to both give and receive damage.

But whatever may come, men of Hartford, men of Connecticut, let us stand by our colors, remembering the truth of Charles Sumner's words that, "All defeats in a good cause are but resting-places on the road to victory at last."

Abstracts and Translations.

MICRO-ORGANISMS IN DENTAL CARIES.¹

BY KENNETH W. GOADBY, L.D.S. (ESQ.).²

CONSIDERABLE attention has been directed to the study of the micro-organisms of the human mouth during the last few years, and the literature on the subject is rapidly accumulating, so that within the narrow limits of the present paper it is impossible to even refer to some of the interesting problems with which the whole subject teems. I have, therefore, selected one especial issue which is of interest to those engaged in the practice of dental surgery.

But before discussing the bacteriology of dental caries, let me draw your attention for a few moments to one or two general considerations of bacteriological work, and note in passing some of the special difficulties attendant on the study of the flora of the mouth.

The mouth, as you are all aware, is admirably adapted to the growth of bacteria, and for this reason, as well as its extreme liability to infection, becomes the resting-place of the many varieties of organisms found both in air, water, and foods; but, as has been pointed out by Sanarelli, Miller, Washbourn, and myself, many of the species quickly disappear, due either to the reaction of the medium in which they find themselves, the temperature, or the action of other organisms. To this latter condition I shall have occasion to refer later.

We are thus met at the commencement with an almost illimitable number of organisms which may occur in the buccal cavity, as well as another equally difficult problem,—*i.e.*, the media upon which to cultivate, many of the buccal inhabitants refusing to grow upon the ordinary laboratory media. There are many other conditions, some of which I have noted elsewhere.³ It will be seen, therefore, that to fully understand what are proper mouth bac-

¹ Read at the Annual General Meeting of the British Dental Association at Ipswich, May, 1899. A grant in aid of this work was made by the British Medical Association.

² Demonstrator of Practical Dentistry, Guy's Hospital.

³ Journal of the British Dental Association, October, 1898, to March, 1899. Trans. Odont., June, 1898.

teria we must meet the difficulty by careful examinations of large numbers of mouths and noting the bacteria most commonly present, whilst the question of media can only be solved by constant and arduous work.

But let us for a time consider the first of these two special problems. Evidently if the various workers in the field are to contribute to the common progress of the subject, the groundwork of their methods must be upon the same plan; that is to say, in all descriptions¹ standard media and processes must be adopted, as well as the special methods which must always be clearly stated, whence it follows that the merely accidental varieties will be separated from those bearing a proper relation to the pathological conditions in which so much remains to be elucidated in the domain of dental surgery.

But what constitutes a new organism? Certainly not morphological differences alone, as so many observers have relied upon (Miller, Vincentini, etc.). No; a new organism must present some points in its biological, pathological, biochemical, as well as its morphological conditions, by which it may be recognized, and in virtue of which it differs from other known organisms. With these reactions carefully worked out upon standard media the new-comer obtains a scientific status; with these it can be recognized by another observer, and the personal equation eliminated by individual work.

In no other region of the domain of bacteriology is morphology more elusive and untrustworthy than among the organisms of the mouth: the curious greasy nature of "Leeuwenhoek's *Materia Alba*," the albumen in the saliva, the *débris* of food and epithelial cells, and, more important still, the pleomorphism of the organisms themselves, all combine to render the morphological forms taken direct from the mouth extremely slender evidence, *per se*, upon which to base conclusion or theory.

In the April number of the *Dental Cosmos* Leon Williams gives photographs of a number of morphological forms stained from the mouth direct, and has to a certain extent confirmed some of Vincentini's work, in so far as he shows that there is ground for some of the statements in Vincentini's book, although not binding himself to adopt all Vincentini claims for the *leptothrix racemosa*.

¹ Committee of American Bacteriologists, Report of Committee, 1898.

I am able, with much pleasure, to confirm a certain amount of the statements, but by no means all, whilst in the first place the method of staining adopted by Leon Williams appears to me rather crude for bacteriological work (staining *débris* in gentian violet and glycerin, in a watch-glass.—*Dental Cosmos*, April, 1899).

Again, the term "diphtheroid organism," as applied by Williams to certain morphological forms, which—in the photographs at any rate—no more resemble the diphtheria bacillus than any other slightly curved bacillus, is a term much to be regretted, especially so as other well-known organisms morphologically resembling the Klebs-Loeffler bacillus are often to be found in the mouth (*cf.* Hofmann), to mention only one variety.

Further, the chance arrangement of bacilli in clumps such as photographed by him is not in the least typical of diphtheria, although it might have been considered so ten years ago.

And, again, involution forms are of such common occurrence in any cultivation of bacteria (*cf.* streptococcus, anthrax, cholera, subtilis, mesentericus, etc.), that much care must be exercised in giving the true morphology of any bacilli. It is also much to be regretted that the experiments as to acid production should have been conducted with such well-known producers of acid as the two staphylococci and *sarcina lutea*, as reference to any good text-book on bacteriology would have given the information (*cf.* Sternberg, "Manual of Bacteriology").

The acid production by organisms is a curious phenomenon, more particularly as the natural growth of bacteria results in an alkaline reaction, and that only certain species in the presence of proper media can bring about a reversion of the alkaline reaction.

It is, therefore, a grave error to mass into one catalogue all organisms which occur upon the teeth as acid producers, although many of them are; and Leon Williams's conclusion, "this complete demonstration of acid-producing forms," to quote his own words, is in no wise a "complete demonstration" until the organisms have all been cultivated on artificial media and their individual efforts studied, a matter Williams tacitly admits he has not done.

An organism Williams has overlooked, or has not mentioned, is one that Washbourn and myself have constantly pointed out to occur in every mouth, and I find that on referring to my note-books I have observed the streptococcus in three hundred different

mouths, and in one hundred and fifty I have isolated them in pure cultivation.

I have experienced no difficulty whatever in obtaining specimens of the fruitful heads by staining by the ordinary Gram method, and decolorizing with chloroform and alcohol, making a careful emulsion of the material used first in distilled water, and allowing the drop to evaporate on the coverslip. These "fruitful heads" consist, as Leon Williams has pointed out, of a mass of cocci-like bodies arranged around the whole length, at the end of a thread. The size is large, the threads being one and one-half to two millimetres wide, the thicker portions of the head three to five millimetres wide; there are also arranged around these, but quite detached, the circular masses photographed by Williams, and termed transverse sections; why, it is not quite clear. I shall have occasion to refer to these again.

These curious threads, with cocci-like bodies arranged round them, can be easily studied in the hanging drop direct,—a method I am surprised has not been adopted by Williams, as it is one of the routine methods adapted in bacteriological work.

I must confess that I was extremely sceptical at first as to the real existence of these fruitful heads, especially as the agglomeration of cocci about a thread may easily be produced by growing a freely growing coccus like *staphylococcus aureus* or *albus* in a broth culture of *B. subtilis*.

Small plates¹ were then examined under the microscope, and the existence of the curious forms noted by Williams and Vincentini were plainly to be seen. The coverslip plates were then incubated at 40° C. in the case of the agar and broth, and examined at each subsequent period of twelve hours for six days, and the results compared with one another. Subsequently an agar coverslip plate was made in the same way, and a group of heads brought into the field, and then the microscope placed in the hot incubator at 40° C., the preparation being examined at intervals of twelve hours, and camera lucida drawings made at each observation to check the development.

Several curious facts were observed. (1) There was little alteration in the general conditions for the first forty-eight hours,

¹ These plates were made by smearing agar or gelatin over coverslips, the plates being cemented with Canada balsam to hanging drop-rings after inoculation.

after which time short thread-like forms were observed growing from some of the cocci-like bodies of the head. (2) In broth, the heads, in forty-eight hours, became in many instances surrounded with masses of cocci; in others, the threads were growing from the spores, but the masses of cocci did not develop into threads. The spores showed considerable Brownian movement, but were not motile.

The threads themselves showed several curious points. (1) Some of them degenerated to a considerable extent, and showed, in their interior, segmentation of the protoplasm into cocci-like bodies. Some of them lay outside the threads. (2) In agar and broth specimens chains of streptococci were seen growing from the cocci on the threads; on the agar plates, genuine streptococcal colonies were found attached to the threads, and which gave cultures of the ordinary mouth streptococcus upon sub-cultures being made. In the threads which showed the attachment of streptococci a considerable erosion of the thread was observed. The cocci were easily differentiated from the spore-like bodies. (3) The short bacilli and spirilla had no apparent connection with the threads, and were moving freely; on agar the bacilli formed colonies. (4) Some of the threads showed branching and sporulation of the penicillium type. (5) Eventually some of the threads underwent formation into cocci-like bodies, by segmentation of the protoplasm, through a large portion of their length. (6) The small clusters of spores (Williams's transverse section) showed development of branches radiating from the central mass. (7) Some threads showed pseudo-branching. The threads are by no means all concerned in this formation of spores, and many of them belong to other species, as will be seen later.

It is somewhat interesting to note that the thread-forms around which the streptococcus develops, and whose surface shows erosion, appear not to develop spores, so that the streptococcus would appear to be antagonistic to its growth, more particularly as on most media the streptococcus "grows down" most other organisms, as has been pointed out by Washburn¹ and myself.

One point in particular is brought out by the foregoing experiments,—i.e., that the process of development actually watched is, (1) spore, (2) thread from spore, (3) spore. Nothing approach-

¹ Trans. Chem. Soc., June, 1896.

ing a sexual method of reproduction was noticed. There is, however, no evidence to show what part, if any, this interesting organism plays in dental caries, and, until it has been isolated and its biological characters studied, the matter is entirely conjecture.

The term "*leptothrix racemosa*" is one that may remain for the present, but the organism much more resembles the *crenothrix* of Rabenhorst than anything else (see *résumé*).

Let us now turn our attention more closely to dental caries. The subject naturally falls under two heads, as far as the bacteriology is concerned: (1) the organisms occurring upon the surface of the decaying dentine; (2) the organisms found in the deeper layers.

Naturally, any organism found in the mouth may obtain access to the carious tooth, but among these organisms certain ones are constantly to be found, many of them being acid producers, others liquefiers of gelatin. The first outcome of investigation of the organisms occurring upon carious dentine showed that a far larger variety and quantity of organisms exists upon the surface than in the deeper layers of necrosed tissue.

The next point appears to be the somewhat curious fact that the organisms which are surface growers,—*i.e.*, *aërobic*,—are in many instances liquefiers of gelatin; they may or may not produce acid; many of them do not change the color of litmus milk. Most of the species I have isolated from the surface of carious dentine are *aërobic* liquefiers, some of them liquefying the gelatin with great rapidity, and also liquefying coagulated blood-serum. A small fraction are *anaërobic* liquefiers, among these latter being *B. mesentericus* (*ruber*, *vulgatus*, *fuscus*). Many of these organisms found upon the surface have the power of producing a brown discoloration of the media in which they are cultivated, especially upon glycerin agar and potato.

The organisms which I have isolated from the deep layers of caries are naturally *anaërobic*, though facultative *aërobic*, and produce acid rapidly when grown in litmus milk or glucose media; they do not, as a rule, liquefy gelatin, and do not discolor the medium.

Miller's work on the destruction of the tooth substance by bacteria is so well known to you that I have not considered it necessary to repeat his experiments in this direction. However, one point required clearing up, as Miller experimented with impure

cultivations, and his results were general. He has well shown that the process of caries is always preceded by a destruction of the calcium salts by the acids produced by the organisms, a matter that my experiments confirm, as will be seen later.

I thought, however, that it would be interesting to determine the specific action of liquefying organisms upon dentine, for it must not be supposed that all organisms capable of liquefying nutrient gelatin also possess the power of digesting the decalcified tooth cartilage or chondrinogen, a point well brought out in the following experiments.

Slices of healthy teeth were decalcified in ten per cent. hydrochloric acid in distilled water, and, when entirely decalcified, were washed in ten per cent. solution of ammonium hydrate, subsequently in sterilized water.

The slices were then placed upon the surface of nutrient media, and the tube inoculated with a pure cultivation of a liquefying organism. Uninoculated control tubes were also made.

Three organisms were employed,—(1) *B. furvus* (Goadby)¹ liquefies blood-serum and gelatin. (2) *B. mesentericus fuscus* liquefies blood-serum and gelatin. (3) *B. plexiformis* (Goadby) liquefies gelatin, blood-serum not affected. All of these isolated from the surface of carious dentine. The media used were agar, blood-serum, gelatin (agar and gelatin three cubic centimetres normal NaOH per litre alkalinity).

In forty-eight hours in (1) and (2) upon blood-serum the slice of dentine was considerably softened. In four days the slice was entirely liquefied. The reaction of the medium was strongly alkaline. With the third organism no liquefaction occurred, although the growth was considerable in both serum and agar tubes. Upon gelatin, however, no liquefaction occurred, even when a decalcified slice was hung for seven days in the liquefied medium. The control tubes were unaltered and showed no growth. From this it follows that liquefaction of dentine may be caused by the digestive enzyme produced by certain bacteria, and that an organism, although having the power to liquefy gelatin in the culture tube, does not therefore possess the power of liquefying dentine. So far as I can find, no other observers have made this extremely simple experiment, which is of considerable importance in the pathology of dental caries.

¹ *Journal of the British Dental Association*, March, 1922.

In making cultivations from the deep layers of carious dentine I have so often met with one organism, a bacillus often in pure culture, that its relation to the carious process cannot be entirely accidental, and, as several of its characteristics fit in with the process of decay, it is important to describe it in this connection. Ordinary laboratory media are adapted to its growth, as of all those organisms to which I have referred in the foregoing remarks.

The method used in its isolation was as follows: Extracted carious teeth were immediately taken to the laboratory, and the surface of the dentine seared with hot instruments in the method always adopted in making post-mortem cultures from infected animals. The outer layer of caries was then removed with sterilized instruments, the surface again seared, and another layer removed with a fresh instrument, and cultures on agar and coverslip preparations made. The direct preparations showed short, thickish bacilli, often in almost pure culture, which stain deeply by Gram, as well as some finer bacilli, cocci, and commas, the cocci being arranged as diplococci. Broth cultivations were also made at the same time.

In thirty-six to forty-eight hours a slight growth of minute, round, gray-white translucent colonies developed upon the surface of the agar. Coverslip preparations made from these colonies show a mixed growth of streptococcus brevis and the bacillus I am about to describe. In the broth tubes the growth is mainly streptococci, although a few of the bacilli may also be found.

The cultures were then plated and a pure colony of the bacilli picked out and streaked on to the surface of agar. From the situation in which this organism is found, Dr. Perry, of Guy's Hospital, has suggested to me the name of *B. necrodentalis*.

The organisms were isolated in this manner from twenty cases of caries, the organisms having the same general characters as follows:

BACILLUS NECRODENTALIS.

Morphology.—Short bacilli three-fourths centimetre wide, one to five centimetres long, often associated in pairs and sometimes in chains; the ends of the bacilli are rounded or square. The bacilli tend to involute rather rapidly and produce swollen and contorted masses, not unlike the involution forms of the streptococcus. In broth the forms are extremely like cocci, especially in the hanging drop owing to the shortness of the elements; this is

particularly well marked when in the form of chains (streptobacilli). The bacilli are slightly motile on aerobic cultures, but more so on anaerobic ones.

Staining Reactions.—Stains by Gram's method and by ordinary aniline dyes, with difficulty by methylene-blue. Many lightly stained involution forms are to be seen on three-day-old cultures on agar. No partial staining or polar staining has been noticed. Spore formation has so far not been observed.

Biological Characters.—Anaerobic, facultative, aerobic, non-liquefying, slightly motile bacillus.

(1) *Gelatin Plates.*—In three to five days minute pin-point colonies may at times be seen, very similar to streptococcal colonies.

(2) *Gelatin Streak.*—Slight dotted growth of minute colonies along the streak in three days; no liquefaction of gelatin occurs.

(3) *Gelatin Stab.*—Three days, slight dotted growth to depths of stab, no marked surface growth; no liquefaction in three weeks.

(4) *Gelatin Shake.*—Five days, cloud of minute whitish-gray colonies; no liquefaction of medium.

(5) *Broth.*—Twenty-four hours, slight general turbidity with precipitate, which may be stringy on giving the tube a circular shake. The turbidity increases very little, but the precipitate increases considerably in forty-eight hours.

(6) *Potato.*—Forty-eight hours, very slight shining appearance. Coverslip shows presence of bacilli, with considerable involution.

(7) *Litmus Milk.*—Twenty-four hours, no change in medium. Forty-eight hours, solid clot, with the lower portion decolored, the top showing a strongly acid reaction. The clot does not become redissolved.

(8) *Agar Streak.*—Twenty-four to forty-eight hours, slight grayish translucent dotted growth, which never develops very much more. Typical short thick bacilli.

(9) *Blood-Serum.*—Very little growth, flat, almost invisible.

Indol.—None in seven days.

Gas.—None observed.

Anaerobiosis.—Grows best when oxygen is excluded in ordinary anaerobic tubes, and especially on glucose media. Scarcely at all on blood-serum.

On agar the colonies are: (1) Macroscopically—gray-white, round and regular, or slightly wavy, with a slight central promi-

nence. (2) Microscopically—brownish, with slight central dot, regular edge, and faintly granular.

In almost any case (sixteen out of twenty), I have also obtained the streptococcus brevis, and as both these organisms are anaërobic, *B. necrodentalis* especially, and from the power they have of acid production, they appear to be largely concerned in the decalcification of the matrix prior to its disintegration by other organisms. The other forms noticed have not so far been isolated upon the ordinary media. The organism, as will be seen from the photograph of the agar culture, is remarkably pleomorphic, even before involution forms have formed.

There is one other organism which I have found constantly associated with others in dental caries (surface), and in two out of the twenty cases in which the deeper layers were examined, and in which *B. necrodentalis* occurred. It belongs to a species hitherto undescribed in the mouth; in fact, Miller says, with the exception of "*cladothrix* and *beggiatoa*" (sewage organisms), all the most common species of bacteria have their representatives in the mouth. Now, the organism I am about to describe to you appears to me to belong to the first of the above two groups,—*i.e.*, *cladothricæ*.

The *cladothricæ* are a curious class of organisms which occur in sewage, and, unfortunately, commonly in waters, especially when there is any putrefaction of any animal or vegetable matter. According to Zopf, "*Spherical, rod-shaped, filamentous, or spiral forms, the filaments show pseudo-branching spore formation not known.*" According to other observers, the branching is not pseudo, but actual, and there appears some reason for supposing that both forms actually exist,—*i.e.*, real and pseudo dichotomy. *Cladothrix dichotoma* certainly show pseudo-branching; the whole genus has, as a characteristic in common with *crenothrix*, *beggiatoa*, and *phragmidothrix*, a remarkable pleomorphism, and as they form threads, isolated and branched, unbalanced minds have decided, without experiment, that the class as a whole is the author, progeny, and actuality of all existing organisms; but you will easily see, from what I have said concerning the heads of the so-called *leptothrix racemosa* (*crenothrix*), bacteria, as stock-keepers say, "breed true," and that when the proper precautions are observed, the organisms may be watched through their various stages of development, and that any phrase development ultimately undergoes all

the typical stages till it returns to the same form again—an insurmountable difficulty to those who suggest that new organisms, carefully described, are merely phase forms of the hypomyces.

A scraping from the enamel of the teeth, and examined in the hanging drop, generally shows a large variety of threads of many sorts, called by older observers by the inclusive term, "leptothrix" (i.e., threads). Upon staining such a mass by Gram I have often found a curious branching organism, the branches for the most part being the pseudo-branching of cladothrix, but when stained the gap between thread and thread is filled up. So far I have only found this organism in twenty mouths, but as they varied from the pathological hyperemia of gingivitis to the normal mouth of an infant of six, the selection is fairly representative. The organism is often the only one which retains Gram's stain after the decolorization by chloroform and alcohol alternately. By the ordinary Gram method (alcohol alone used for decoloring) other organisms are stained. This remarkable organism, whose pleomorphism is unbounded, can be obtained in pure cultivation. I suggest for it the name of *cladothrix buccalis*; it is as follows:

CLADOTHRIX BUCCALIS (GOADBY).

Morphology.—Red-shaped, filamentous forms, with general appearance of branching, except in the hanging drop. The threads are somewhat slender, and the ends are often club-shaped. The threads often appear articulated, like a strepto-bacillus, similar to *cladothrix dichotoma* (Cohn). The branching does not, as a rule, show such a dichotomous nature as is seen in the other described forms of *cladothrix*, the branches appearing more at right angles to the main stem, especially in agar cultivations. On potato, an unparalleled pleomorphism occurs, and all varieties of morphology may be seen, spirillae, threads, bacilli, cocci. The development of the threads from the cocci may be seen. The clubbed ends take the stain deeply.

Staining Reactions.—Stains by Gram and by ordinary aniline dyes; the threads often have semi-stained portions. The clubs take a deep stain.

Biological Characters: (1) *Gelatin*.—Little growth, no liquefaction. Fourteen days, liquefaction at surface of slab.

(2) *Agar*.—Forty-eight hours: small, hard, round, raised, transparent, or slightly cloudy colonies, about the size of a pin's

head. Three days: raised, truncated cones, whitish brown, and in the older colonies a slight crack appears across the top of the cone. The colonies eventually cause a slight depression in the agar. They are extremely difficult to remove with the platinum needle, and must be removed entire. The agar is colored a dirty brown. These colonies are extremely characteristic. The coloration is not constant.

(3) *Blood-Serum*.—Similar to agar; no liquefaction takes place.

(4) *Broth*.—Very little growth, slight flaky precipitate.

(5) *Potato*.—Yellowish or orange-brown hard flat layer; the top of the potato is often covered with round chalk-white colonies about the size of small shot.

(6) *Litmus Milk*.—No acid reaction, no clotting.

A curious earthy sour smell is given off from the cultivations, which reminds one of a damp, musty cellar.

RÉSUMÉ.

In summing up the foregoing remarks we find the question falls under two divisions:

(1) The relation of certain organisms to the destruction of tooth tissue. (2) The difficulties in separating true species from morphological forms, and, I may add, the question of occurrence of the hypomycetes in the mouth.

To take the latter first. The fruitful heads and other phenomena of Vincentini's *L. racemosa*, as observed by myself in the coverslip plates, agree in many respects with the crenothrix Kühnina of Rabenhorst. (1) The morphological variety of its arthrospores. (2) The small transverse sections of Leon Williams seem to me to be small zoogloea masses, especially as in the broth hanging drop these masses developed threads in the manner described by Rabenhorst and Zopf.¹

These little tufts of threads are often to be seen in preparations stained direct from the mouth. Under these circumstances crenothrix buccalis is a better term than leptothrix racemosa. The cladothrix buccalis (Goadby), which I have described to you, differs in many respects from the cladothrix dichotoma of Cohn. As no

¹ Leon Williams has since demonstrated to me that these transverse sections are the ends of the "fruitful heads" seen *end on*.

sulphur grains were observed, the question of leprogation is eliminated. The phragmidothricæ have, I believe, so far only been found in sea-water; however, phragmidothrix multiseptica is not at all unlike the crenothrix we have discussed. The cladothrix buccalis has such remarkable pleomorphism, especially in potato cultures, and corresponds so closely with Zopf's nomenclature, that I think we may leave the matter for the present.

In dental caries a number of organisms have been described which color the culture media a deep brown. I find the potato bacilli, *B. mesentericus*, *ruber*, *vulgatus*, *fuscus*, commonly in the mouth; they are among those that discolor the medium. Arkövy's *B. gangrenæ pulpæ* produces discoloration, but has a distinct and unpleasant smell, like bad cheese; it differs from *B. necrodentalis* (Goadby) in this respect as well as in the liquefaction of blood-serum and gelatin. Miller's *B. fuscus* colors agar brown, but no further details are given. Jung describes an organism (coccus or bacillus not stated), which, from its reaction, appears to be *B. mesentericus*. Martin Freund gives three chromogenic, but the pigment differs in many respects from those organisms I have described. So far I find no other organism in any way resembling the *B. necrodentalis*.

The liquefying organisms I have isolated appear not to correspond with those isolated by Vignal.

In conclusion, I maintain that in dental caries (1) the liquefying organisms are mostly aerobic; (2) the acid-producers are largely anaerobic; (3) that liquefaction of gelatin does not imply digestion of dentine, but liquefaction of blood-serum may; and, finally, that the demonstration of cladothrix in the mouth does not imply that all the other organisms of the lower class of schizomycetes found in the mouth are simply phase forms of the hyphomycetes.

Since the above paper was written I have made a considerable number of observations on the genus cladothrix.

The cladothrix which I have isolated from the mouth, and discussed at some length above, differs from the following varieties in its biological and other reactions:

C. dichotoma of Cohn; *C. nites*; and from the cladothrix given to me by Leon Williams as well as several other species, cultures of which have been sent me by Dr. MacCuskey, of the Royal Commission on Sewage.

I have also isolated *C. dichotoma* from several mouths and throats as well as the *C. buccalis*.

The culture given me by Leon Williams most resembles the *cladothrix* described above, but, nevertheless, differs from it in many respects.

I hope shortly to publish more fully the details of these experiments.—*Journal British Dental Association.*

Reports of Society Meetings.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology was held on the evening of February 27, 1900, at the rooms of the Academy, 1731 Chestnut Street, Philadelphia, the President, Professor E. C. Kirk, in the chair.

A paper upon the subject of "Hypnotic Suggestion in the Practice of Dentistry" was read by Professor Walter H. Neall, of Philadelphia.

(For Professor Neall's paper, see page 437.)

The President.—You have listened to this very interesting paper, and it seems to me a very appropriate subject, one that appeals very definitely to us as dental practitioners. I trust that there will be a full discussion, and I will call upon Dr. Truman, who has some knowledge of this subject, to open the discussion.

Dr. James Truman.—The study of this subject is one profoundly interesting, more so, perhaps, in former years than at the present time. I was perhaps seventeen years of age when I first saw a patient subjected to what was then termed "mesmerism." The sight created in me profound astonishment and interest, and from that period up to the present time I have more or less investigated the matter.

It has been one hundred and twenty-five years since Mesmer first broached the idea of the control of the human mind, and many have an idea that Mesmer was what we call a quack. That is a very great mistake. He was a man of superior education, learned in divinity, because he was a theologian at first, and subsequently

studied medicine, graduating in Germany, so that he was by no means an empirical individual. Yet he had a great many of the characteristics of what we would term "quackery" about him. It was not, however, until 1844—that remarkable year which developed anesthesia—that Reichenbach gave forth the idea that there was a force in the human organism, which he termed "odlic force," or "odyle." Now, Reichenbach was a distinguished scientific man. He was the discoverer of creosote and paraffin. He thoroughly investigated this force and confirmed Mesmer's idea that there was a certain aura in the human organism. He demonstrated, through a large number of experiments, this odlic force. I do not know whether this has been confirmed by scientific observation since his day.

Now, the subject of hypnotism, which was the name originally given by Braid fifty years ago, has been brought up every now and then in dentistry and in medicine, but more especially perhaps as an aid to dental operations. I would not deny that it cannot be made effective. I have seen too much of it to assert that pain cannot be relieved materially by suggestions of this kind. It is a positive force. I have not the slightest doubt about that, but the question arises, "How are we to use it?" Would it be more justifiable to use it in the office without a third person present than in the case of administration of an anæsthetic? Would it not very soon be reported that Dr. So-and-so was using hypnotism? And you know the general feeling abroad in regard to this influence. I am afraid that the practice of a dentist adopting this method would be likely to suffer, and yet that has nothing to do with the main fact after all,—that pain can be prevented. Hypnotism is, to a certain extent, an analgesic, and operations can be performed under it. That I know. My father, who was a medical man, used it to a very great extent in various ways, not only for the extraction of teeth, but in the sick-room. Many people who are in a nervous, hysterical condition imagine themselves sick, and with such that power, properly used, may be of great advantage.

Now, somnambulism has been referred to in the paper. I do not think that there is any difference between the two states. One is self-induced, so to speak. Those who have had any experience with somnambulism know that it is a very peculiar condition. Perhaps I have had the fortune, or misfortune, to have had a great deal to do with it. I had it in one of my family,—a daughter nine

years of age, whom we could not control. At night she would get up and walk around the house. We were obliged to fasten down the windows, and she gave us an immense amount of trouble. I had an assistant at that time who boarded with me. That young man would get up in the night and go out into the street. I have known him to go up to my office, start the fire, burn the lights, spend most of the night there, come back, get into bed, and be wholly unconscious of having done anything. I was obliged to use very strong measures with him in order to stop it. That seemed to have the desired effect, but it did not prevent the eternal racket that was continually going on up-stairs.

Now, I think from all that I have observed, and the years of observation that many of our scientists have had, that it is rather late in the day for any one to taboo this hypnotism. I am glad that Dr. Neall has given us a very clear statement of his experience with it. There is a vast deal of benefit which may be derived from it, and it is high time that scientists should take hold of it instead of ignoring the facts surrounding it.

Dr. M. Schamberg.—I have investigated this subject and have given it considerable thought and study, but I must say that within the past few years, for somewhat the same reasons that Dr. Truman has advised not to adopt it in practice, I have given it up to a very large degree. I feared the result of criticism in its use in a private office when alone with a patient, and where a patient who does not fully understand the conditions and value of hypnotism might ruin one's reputation.

I want to cite a few experiments that I have conducted along the dental line, and I think they picture somewhat the various classes that the essayist has brought to your notice. One case occurred when I first began dentistry, in the extracting-room of the Chicago College of Dental Surgery, when a patient demanded the use of cocaine for the extraction of a tooth. The demonstrator told me that they did not use the drug, and advised me to try to pacify the patient or induce her to have it taken out by some other means. I finally resorted to one form of suggestion, and taking a small portion of plaster of Paris, I mixed it with a little water on a slab, in a very careful manner, meanwhile telling the patient that cocaine was highly toxic and that in case any of it should reach her tongue she was to spit it out, etc. I then applied very carefully with cotton a small portion of this plaster to the gum about the tooth. I ex-

tracted the tooth and the patient claimed that she had absolutely no pain whatever, and even insisted that I take a fee.

Another case is one in which I had my brother put a patient of mine into an hypnotic state. I removed a number of roots from the mouth absolutely without pain. The patient awoke, and would scarcely believe that I had removed them. There are numerous cases of this kind. The unfortunate thing about hypnotism is that it has been the subject of amusement rather than scientific research. Men are travelling about the country exhibiting their powers of hypnotism,—sometimes genuine,—causing their subjects to do ridiculous feats upon the stage. This naturally arouses in the minds of those who are inclined to be sceptical a very peculiar idea about hypnotism and anything but a scientific view of it.

I must say, however, that there is a wide field in hypnotism itself. We all know the immense amount of value that suggestive influence over our patients has in our dental offices. There are exceptional cases, however, in which we deem it advisable to hypnotize a patient; by that I mean to put them in an hypnotic state. While the principles of suggestion and hypnotism are somewhat the same, hypnotism itself means the state of this peculiar sleep, and it has been thoroughly investigated.

Many years back they divided the state of hypnotism into three states,—lethargic, cataleptic, and the somnambulistic states,—and these states carry with them certain phenomena. You must conduct certain experiments under one and certain under another. In the cataleptic state the patient will obey orders and follow out suggestions as they are given by the operator. In the cataleptic state one may become rigid, or many feats of an athletic nature be conducted. In the somnambulistic state we have suggestive conditions occurring, as described by Dr. Truman. Unfortunately it is a condition which is not understood as are other sciences. The subject is vague; we cannot get down to the actual cause of the conditions that hypnotism will produce. They are really so marvellous and perplexing that it is dangerous on that account.

I will relate one peculiar experiment that I was in the custom of conducting while the patient was deeply in the lethargic state. I would state that one side of the body was thoroughly anesthetized, and that when injuries were inflicted, such as pricking the side of the body, the sensation would be transferred to the opposite side. I would then prick the hand of the patient

with a pin, and the patient would evince pain in the opposite hand, showing that anæsthesia was produced on the one side and the sensation imparted to the opposite side. Then there is the post-hypnotic stage, in which patients will follow out suggestions that were made in the hypnotic state, but which may be directed for a period of even a year after the experiments, the patient at that time obeying the will of the operator or the suggestion made while in the hypnotic state.

These things are so perplexing that one is immediately looked upon as a very curious creature who is able to accomplish these peculiar things. Had I prepared remarks for this evening, I would have been able to give you a more valuable talk on the subject, but I have simply given you what few facts have come to my mind since rising to my feet.

Dr. W. H. Whitslar (Cleveland).—I am not familiar with the entire matter, but all those who have had some experience in dentistry know that there is a certain amount of hypnotism which we exercise over our patients. There is a certain aura in which we live whilst we are in conjunction with these people in operating for them, and as we control this aura so we control their minds. The subject of simple suggestion is the one with which we desire most to deal. I think the fourth class should be eliminated from practice, because of the dangers into which we may fall by creating unpopular opinions against us. There is one thing which we may do in this work of suggestion, and which we all strive to attain unto, and that is the elimination of fear. When we have eliminated the fear of pain, then we have control over the patient and are able to produce the results that we desire. Then the pain of working upon the ends of the dentinal fibrillæ is lessened. I think that when we are in the state of fear the brain-cells are like the turbulent waters of Niagara as they are passing through the rapids,—our brain-cells are jumping here and there. Where we have subdued the turbulency it produces an equilibrium of nerve-action, and consequently fear is eliminated and pain is lessened.

Dr. E. C. Kirk.—The thing that we actually experience in our persons gives us the most definite and solid foundation for belief, and there are certain workings of the human mind that one may study in his own person. From a philosophic point I can conceive of no more wonderful thing in nature than the phenomenon of a human brain investigating for itself how that particular human

brain works. These peculiar or abnormal manifestations of mental phenomena excite a good deal of misunderstanding, interest, and superstition.

The first and most essential fundamental fact underneath this whole question is the power of a suggestion, be it from an individual or contact with things, to set in motion a certain line of muscular activity by action through the nervous system. I use the following illustration to classes when dealing with this subject in its practical aspect, particularly with reference to the control and the care of children during the first visit to our offices. It is a homely suggestion, but I would like to give it to you now. No doubt you have all had similar experiences.

Not very long ago I saw upon a bill-board a statement in white letters on a blue ground, to the effect, "Unesda Biscuit," and the first effect of it upon me was for me to say mentally, "Not much; I do not need a biscuit, and I will not permit anybody to tell me that I need a biscuit, when I know whether I need it or not." At every bill-board I passed was the legend, "Unesda Biscuit." I grew more and more irritable about the thing, and I made up my mind that I would never buy one and would have nothing to do with the man who had the impertinence to urge the suggestion. I kept to that mental attitude for some time, and I said, "I will not read the thing." About a week afterwards the advertisement had changed somewhat and now read, "Do you know Unesda Biscuit?" Well, I knew I did not, but, looking at it again, the miserable thing took a new aspect, and raised a doubt that I might be mistaken. It took some days for that to work out, and I thought the only way I could determine the question was to go and buy one, and see if I did need it. What was accomplished? Why, I had taken a part of my hard-earned wealth and gone to a shop and given it to a man in order to settle a point raised by a suggestion, and that is just what the advertisers aim at. I understand the firm has grown wealthy through the potentiality of that suggestion.

Let us take, for example, the child patient, or any subject upon which we wish to perform this experiment or get anything done. Let us say, for example, it is the extraction of a tooth or infliction of pain. The individual's mind is actuated by that idea,—I am to suffer pain,—and his whole muscular and mental attitude is dominated by the force of that suggestion. It is the business, then, of the operator to annul or get rid of that mental idea; and the object

in hypnotic suggestion is to devise a means to annul that controlling idea and substitute therefor some other idea. That is as I understand it. We have to get rid of that muscular and mental *status quo* of that patient by some device or other, and then we can insert, as it were, this new suggestion and take advantage of that power or force. While not speaking dogmatically, I do not regard hypnotism as a power or force. It has no potentiality in itself. Whatever effect is produced is original within the subject hypnotized. I do not believe a force, an aura, or potentiality goes out from the operator. I am not ready to accept it, but I do not assert that it is not true.

Illustrative of the idea of elimination of fear referred to by the essayist and by Dr. Whitslar, I have in mind a very interesting case. We had in the class at college a student from California, who was assigned a day for extractions. Not a single patient appeared until late in the afternoon, when a woman put in an appearance and demanded an extraction with gas of some four or five teeth. As there was no demonstrator at that time, and no gas apparatus available, he explained to her that they did not give gas at that time. She was about to leave, and to avoid losing his opportunity he said, "I will give you electricity." She consented; so from his locker he brought two spirit lamps, and placing one in each of her hands he directed her to hold them very firmly and to open her mouth, which she did. He took out five or six teeth while I stood by as much hypnotized as the patient. I expected momentarily to see the patient leave the chair in indignation, but she sat with a perfectly placid expression while he removed one tooth after another. When he was through, she said that she had felt very little pain, and thanked him cordially. Not all persons are as impressionable as that patient.

Dr. James Truman.—I cannot believe that there is no fluid, or power, passing from the operator. I have performed this a great many times, and I am confident it is more than mere suggestion when you get to the hypnotic stage.

Dr. Schamberg speaks of post-hypnotic suggestion. Now, I think there is a vast field there, of very great value if it were only properly applied. We have a great many persons who are in the bad habit of using different drugs. Others smoke too much. To illustrate this: A powerful hypnotist had a friend, a gentleman, who was an hypnotic subject and a very great smoker, and while he was in the hypnotic state, she made him promise that he would

not smoke for two weeks, while he, of course, knew nothing about it. When he came out of the sleep he went home and to his store. The next day he wanted to take a smoke. He could not smoke and did not. Every time he took the cigar there would be that opposition. I cannot see how mere suggestion would carry that far. At the end of two weeks he took a cigar and smoked it. On another occasion he started from the house to go home. When he had reached three blocks away she willed that he should come back. He did not know anything about that, could not possibly have known it. But he could not take a step forward. He tried, but could not move, and had to turn back to the house.

Now, these are a few facts out of many hundreds that might be related indicating a power that we are more or less ignorant of, but it seems that there is some mental power that can be carried a very great distance. I have seen people put to sleep by an operator some distance off in the same room without further manipulation than the pretence of magnetizing a glass of water, and can vouch for the phenomenon, as the subject was one of my family.

Dr. McCullough.—Some four years ago a patient was introduced to me with the understanding that she was to be treated with great care. From her appearance it seemed that she was suffering with cardiac debility or anæmia. At the first visit she fainted three times within fifteen minutes without my having said anything to her at all. After recovery from these faints I assured her that I was only going to examine her teeth and that I did not have time to do anything else. The next time she fainted, but I did some slight operation. The third time she did not faint, but jumped out of the chair and started to walk around the office. Fearing she might faint, I walked around back of her, for I was fearful lest she might fall. When I discovered that this young lady fainted so readily, I thought she might be induced to faint. Therefore, I prepared on a special occasion to extract a very bad tooth. As soon as everything was ready I told her I was going to extract the tooth. I presented the forceps and she fainted. Fortunately her jaw fell down and I extracted the tooth, but before the tooth was out of her mouth she came to, and afterwards said she absolutely felt no pain. I have not seen this young lady for two years, and on receipt of the card announcing the subject for this evening I naturally recalled my experience. The next day a messenger came from her, asking for an appointment.

Dr. Kirk.—I think I was very explicit when I said I would not dogmatically assert that it was not so, but I have never had any experience in my life to lead me to believe that there was such a thing as thought transference. I am sceptical about the possibility of explanation on the basis we have just heard related. I think if each one of us would make a record of the remarkable coincidences that happen in one's life, that are pure coincidences, that they would have a definite scientific value, as apparent causes of telepathy. But the power of suggestion and of post-hypnotic suggestion are both, it seems to me, perfectly explainable upon the basis of the very great potentiality of an idea or of a suggestion in originating ideas.

Dr. James Truman.—How would that bring about unconsciousness?

Dr. Kirk.—Consciousness, I believe, is an active condition of the cerebral cortex. As soon as we obliterate functional activity, we must have sleep. That would be a negative condition, being opposed to consciousness, and just as in paralysis there is obliteration of the actual functioning of the cerebral cortex, we have a tendency towards sleep.

Dr. McCullough.—I have read the physiological explanation of sleep. I understand that the phenomenon of sleep is explained as anæmia of the brain. Of that I am not sure, but it seems to me that that point was made in an argument, wherein it was proved that hypnotism would produce artificially an anæmic condition of the brain. A shining object before the eyes, upon which the patient has concentrated his sight, has the effect of producing this anæmia, though the fact is that never was our mind concentrated upon any one object to the total exclusion of everything else. Concentration like this has the effect of producing an anæmia of the brain, which in its weak condition is exposed to the influence of the operator.

Dr. Neall.—I have nothing more to say except to state how Mesmer proceeded to hypnotize his patients. It was to keep them in a dimly lighted room. Sometimes the hands were touched; at other times they were bound by a silken cord. He would enter the room in a fantastic garb, and would touch one person and then pass around to another. Men would have palpitation of the heart, and women would shriek. As to carrying this to the *true* hypnotic stage, it, of course, would not be the proper thing at all without a

third person present. I have not in my office carried it to that period, but simply to that hypnotic *suggestion* in which patients seem to yield to the control of the operator, and have abandoned the idea of fear of pain until the operation is completed.

It can be practised if one makes up his mind to study the art, but not upon everybody. If you want to get a person into a state where you can control them mightily, generally suspend some bright article about eight or ten inches above the eyes or forehead, so that, in looking at it, the eyes are raised and also the eyelids, and if a person is to be impressed at all, he will come into that condition in from ten to twenty minutes, and be unable to control the eyelids or part the clasped hands if told he cannot. As a boy I used to watch my grandfather do this. He was one of the operators who extracted teeth on a public platform when the subject was hypnotised after this manner. I have seen the same things done at a private seance. I should imagine that any person with strength of mind and determination could be able to do this with a subject that can be impressed.

I would avoid taking into the office Class 2, unless somebody were present. I do not operate without having a lady attendant, so there would be no danger of scandal arising from it.

OTTO E. ISOLIS.

Editor Academy of Stomatology.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, April 4, 1900, at six o'clock, Dr. V. C. Pond in the chair.

President Pond.—It has been truly said that all progress is marked by some mechanical invention. An ingenious person makes some little invention, apparently a trifling thing, that is developed, and in time it revolutionizes everything and enters into our movements in every way. We have the common examples of the steam-engine and the steamship and the Bessemer steel process. We have it in the electric motor, and in every application of electricity. It is especially true of the subject we have before us to-night. Every

invention and every development of it has changed our knowledge, our practice, and our views in every way, and especially the lines in which we are directly interested.

It gives me great pleasure to present to you Dr. Harold C. Ernst, who will speak on "The Development of the Microscope."

Dr. Ernst then took up the subject of the microscope and its development from its first stages in the seventeenth century, illustrating by means of an elaborate series of lantern-slides the successive changes, modifications, and improvements in construction and application which it has undergone in its evolution from the most primitive form of magnifying glass, when it was looked upon merely as a plaything, to the perfect scientific instrument of the present day. Dr. Ernst's subject having been almost entirely confined to illustrations from lantern-slides, with descriptions, it is regarded as too elaborate for reproduction.

Dr. Andrews.—I do not know that I have anything to say, except that I wish to express my very great pleasure at hearing this paper with its wealth of illustrations. I have been very much interested in my trips to Washington, where I go once a year, in visiting the Army Museum, where I have seen a good many of the forms that Dr. Ernst has shown. They have one of the best collections of microscopes in this country, but the doctor has shown us a good deal more than we see there, and we are particularly indebted to him. I have enjoyed this exceedingly. I think we owe him a debt of gratitude for bringing the subject before us in such an interesting manner.

Dr. Hopkins.—Mr. President, I can only repeat what Dr. Andrews has said,—that we owe so much to Dr. Ernst for the months and years of labor that we have had concentrated in this lecture this evening. Aside from the vast amount of information on the very important subject that he has given us, I think he has given some light as to the direction that the future progress of our profession must take. The dental profession has advanced in technical skill, so that apparently there is hardly room for improvement. There are men to-day who are doing in their offices, almost every hour of the day, operations that require so much skill, so much delicacy, that they equal, certainly in skill, the most brilliant operations that our best surgeons perform. The advancement of our profession, it seems to me, must be along other lines. Our knowledge of histology, pathology, and bacteriology will be dependent

upon this instrument that we have heard so brilliantly described to-night; and it seems to me that therein lies the direction in which we must progress, and that it opens to the view of us all a new direction in which we may extend our knowledge into unknown fields; and I hope that this will have not only the practical benefit which the increased knowledge of the microscope has given us, but will lead to further research by members of this Academy.

Following the discussion upon Dr. Ernst's lecture, a paper entitled "Dental Education," by Eugene S. Talbot, M.D., D.D.S., of Chicago, was read, after which the meeting adjourned.

(For Dr. Talbot's paper, see page 458.)

CHARLES H. TAFT,

Editor American Academy Dental Science.

Editorial.

IS DENTISTRY DRIFTING INTO MEDICINE?

It has been necessary to occasionally refer to the drift of thought in the dental profession in the direction of a general medical education. The matter has been discussed extensively in various dental bodies, and especially in a series of well-prepared papers read and discussed in the Section of Stomatology, National Medical Association, recently held at Atlantic City, N. J.

If the papers and discussions were confined to those directly connected with dental educational procedure, the results would be of more importance, but, unfortunately, this is not always the case.

There seems to be a tendency in many minds to magnify the importance of the degree of Doctor of Medicine. This may be due to a desire to stand well with the medical profession through the influence supposed to exist in the title, and, possibly, to a very mistaken feeling that the word dentist carries with it some measure of social inferiority. The result of this combined feeling has been a constant agitation among a large class, generally outside of college circles, to effect a change in present educational methods, and to do away with the old degrees in dentistry and substitute therefor the general degree in medicine. It seems to be forgotten that the

obliteration of the old titles does not make the possessor of the higher more worthy of recognition from that simple fact. The discussion of this subject has undoubtedly been productive of good results, but it must not be forgotten that all great changes come slowly and cannot be rapidly advanced by theorists, but only through evolutionary changes,—a slow growth from the lower to the higher.

Dental education has been gradually tending towards the medical degree for the past thirty years, and those who have watched the trend of thought have long since come to the conclusion that at no distant period dentistry would be merged into medicine, and that the dentist of the future would practise as a specialist under the one general title of Doctor of Medicine. While this is one of the certainties of the not far distant future, it does not necessarily follow that it will prove satisfactory to those who regard of some value that which has been attained by the dentistry of the past.

It is unnecessary to refer to the cause of the separation of dentistry and medicine. It is usually ascribed, in this country, to the refusal of the medical men of Maryland to accept Dr. Harris's proposition to have established a chair of dentistry in the university, and that this refusal led up to the organization of dental colleges. While it is true this marked an era in dental progress, the real separation dates back to the very beginning of dentistry, lost in the mists of time. The fact that it certainly began as a mechanical art for the replacing of lost dentures settled its status. The professional man could not fraternize with the mechanic, and the latter was equally unfitted to mingle with the former, and thus the gulf widened by the lapse of ages. This continued, with no thought of change, until some dentists, ambitious for a supposed better standing socially and professionally, sought the medical degree, some for the increased information secured in its attainment and others for the better social position it was supposed to give.

During this evolutionary stage the colleges of the higher class have steadily advanced the entrance requirements in this country, and have brought the strictly medical branches very nearly up to the standard demanded of graduates in medicine. Those schools connected directly with universities and the higher medical colleges have the curricula so arranged that up to a certain limit the dental students are medically educated. In the school with which the writer is connected the curriculum has been steadily advanced

for the past twenty years, and has, at present, reached the limit of extension until another year can be added to the present three years course, when it will be still further advanced, leaving nothing to be desired except, it may be, the degree in medicine.

Does this degree carry weight? The answer will be in the affirmative or negative as the individual may view it in all its bearings. To some it means much; to others, who have but little faith in titles, it is not regarded with much respect. It should always mean thorough training and ability to practise medicine, but it is quite evident to those well informed that it only indicates that some have brilliantly answered a series of questions, written or oral, and others have managed to work through by the persistent efforts of the quiz masters. It is, therefore, no sure test that the man who has secured the degree is really qualified to practise his profession. The same applies with equal force to those receiving the dental degree. The second act in this drama of life is the final examination of the State boards, medical and dental, and the farce of final examinations is complete. The truth is as old as humanity that if a man or woman knows a thing, that knowledge is sure to be made apparent, and if he or she continues to occupy a mediocre position, it is equally clear that both are living on the degree. There are dentists who possess a knowledge of medical subjects equal to those medically educated, and there are medical men fairly well informed upon the main facts of dentistry.

There is a tendency in all the discussions of this topic to belittle the work of the dentist. The assumption is that he is following a calling essentially inferior to the older profession. This may not be formulated in words, but it is implied in nearly all the papers of those who advocate the abandonment of the dental degree. "We want a higher standard," is the cry of those outside of college work. Some of those making this demand may know what a higher standard means, but with the majority it is simply a childish request for something not immediately attainable.

Dentistry has no reason to beg for recognition. Such a demand is always an indication of partial culture. Dentistry has a position secured by long years of patient work. It has demonstrated that the oral cavity contains within its borders sufficient to occupy the best thought for a lifetime of those who practise therein. It has proved to the doctors of medicine that for uncounted centuries they have neglected the principal source of

disease, and that this neglect, to their discredit, still continues. It has proved that the pathological conditions of this cavity hold intimate relations with the general organization, and are a source of continued infection. It has proved that it has been possible to lessen the terrors of old age and prolong the period of life, and to make that period one of comparative comfort; and, finally, it has forced the respect of the men who treated it in the past with contempt, and they have been obliged, however unwillingly, to believe that the time has come when the partial degrees in dentistry should be abandoned.

What will this mean for dentistry? This brief question contains within it more difficult problems than this article can possibly solve. The answer may be partially outlined by the results of experience. The writer has observed that, in proportion to the advance in the preliminary entrance standard and the curriculum, the technical skill has been lowered. This has been so continuous that it is impossible to ascribe it to some temporary and incidental cause. It is peculiarly marked in those who have attempted the study of dentistry after they have spent the required years in the mastery of medical subjects. In a long experience the writer cannot recall a single instance of a medical man acquiring technical skill during his sojourn at college. The advance of the preliminary entrance standard to the very highest degree possible at the present time—the diploma of a high school, unless that be a high school of manual training—promises to lower the standard of dental attainment. This is no fanciful idea, but is based on actual observation. The results are not in accord with the previous views held by the writer, and are, therefore, in direct opposition to the anticipations held by himself and others. That there are exceptions to be noted remains true, but where these exist the mechanical talent has been developed in earlier years and by other methods.

This statement will not be credited by that class of mind that is constantly demanding a higher standard. Educators of experience accept these changes with hesitation and doubt. They cannot avoid the conclusion that the practical side of dentistry has suffered and will continue to suffer in proportion as the curriculum is extended at the top. Like an inverted pyramid, it must eventually fall by its own weight.

The writer must not be misunderstood. He is not contending for a lower standard; indeed, every desire of his mentality is for

a more cultured class in his profession, but it is not what may be desired, but what can be attained.

That we are drifting towards the end most desired by some needs no argument, but when time has solved this problem it will bring with it another for the dentists of that period, and that will be, by what means will they be enabled to recover the then lost art of dentistry?

Bibliography.

TRANSACTIONS OF THE NATIONAL DENTAL ASSOCIATION. Including Proceedings of the Third Annual Session, held at Niagara Falls, N. Y., August, 1899; Proceedings of the Second Annual Session of the Southern Dental Association, Branch of the National Dental Association, held at New Orleans, La., February 9, 1899. S. S. White Dental Manufacturing Company, Philadelphia.

This volume exceeds in size any of the publications of the National Dental Association. This is partly due to combining the work of the Southern Branch with the proceedings of the main body, the first taking up two hundred and thirty-two pages and the latter four hundred and eighty-five, or seven hundred and seventeen in all. While this is the most voluminous report issued from this organization, it has the merit of being, probably, the best. Valuable papers are here given a permanent place in dental history. It would be difficult and invidious to select special papers for notice where all have a distinct value, but it is thought that Dr. Brophy's "Cure of Congenital Cleft Palate," while previously reported, must take rank as the most important contribution to surgery. Those who were present and witnessed the wonderful results obtained must give him credit for originating an operation more effective than anything heretofore attempted.

Space will not permit an extended notice of this valuable report. It is a striking illustration of the good to be accomplished through national bodies properly conducted. While the writer's ideal has not been reached in this direction, the fact remains that

those who neglect the mingling with these associations gradually fail to remain in touch with the best thoughts in dentistry.

The S. S. White Dental Manufacturing Company are to be congratulated, not only in bringing out this report at an early date, but also in its careful and tasteful production.

Domestic Correspondence.

THE VALUE OF LOCAL ANÆSTHETICS.

TO THE EDITOR:

SIR,—I am engaged in an investigation of the value of local anæsthetics, and members of the dental profession can materially aid me by answering the questions appended. There is such a marked diversity of opinion as to the propriety of applying local anæsthetics about the mouth, that any attempt to arrive at a statistical conclusion should meet not alone with favor, but with the hearty co-operation of the profession at large. Few dental institutions of learning advocate or teach the use of local anæsthetics, and still, as each graduate enters upon his professional career, he is confronted by the important question, Is one justified in using local anæsthesia to alleviate the pain in dento-surgical operations?

Some men are firm advocates of the use of local anæsthetics, others strongly condemn them. If one man gets good results with the refrigerating spray or the cocaine-charged syringe and the other does not, investigation may show that they are at variance in their methods of application.

When concerted opinion is absent in the profession, who is to decide in an individual case whether the post-operative swelling or sloughing is due to the traumatism, infection of the part, or the toxic effect of the anæsthetic?

Many important points of this nature should be brought out in this investigation, and I kindly request that answer in full be made to the questions mentioned. Space is provided upon the enclosed question slip for the report of any interesting cases bearing upon this subject.

Due credit will be given for all information.

MORRIS I. SCHAMBERG, D.D.S., M.D.,
*Late Acting Assistant Surgeon, U. S. A.; Quiz-Master in
 Oral Surgery, Association of Quiz-Masters, University
 of Pennsylvania; Clinical Assistant in Surgery, Poly-
 clinic Hospital, Philadelphia.*

1626 WALNUT STREET, PHILADELPHIA, MAY 10, 1900.

QUESTIONS.

1. Do you employ local anesthesia in your practice?
2. Kindly state what drugs or combination of drugs used for this purpose, and also your method of employing them.
3. Have you observed any untoward effects, either constitutional or local, from their use?
4. What means, if any, do you find necessary to prevent post-operative swelling and sloughing?

Remarks or reports of interesting cases.

Obituary.

THEODORE MENGES, B.S., A.M., D.D.S.

DR. MENGES died June 1, 1900, after an operation for appendicitis.

The unexpected death of Dr. Menges has brought a feeling of sorrow, not alone to those of his family and intimate associates, but to a large circle covering a wide extent of country. He came into dentistry late in his active life. Having been an educator in the West for many years, he accidentally became interested in dental education, and was for some time personally and financially connected with the American College of Dental Surgery of Chicago. He devoted all his energies to that institution, and finally brought about a union of this school with the Northwestern University Dental School. He fully demonstrated his great business ability in bringing the American College of Dental Surgery up to a high standard of excellence, and thus he continued after the union with the Northwestern University, and it was mainly through his exertions, aided by a corps of superior instructors,

that this college to-day stands among the leading dental schools of the country, both in point of number of students and training.

He devoted his life and means to the advancement of the dental profession. With some men this would not mean much, but with Dr. Menges it resulted in work day and night, never seeming to weary and never willing to rest while something was to be done to raise the standard of his school and the profession.

He became a member of the National Association of Dental Faculties, through his connection with the American College of Dental Surgery, and continued as delegate after the union with the Northwestern. Those connected with that body soon discovered they had as a fellow-member a born leader of men. His energy was unflagging, and through word and pen he endeavored to carry out his ideas, and that with a force that always commanded a respectful hearing, though not always with assent. He was made chairman of the executive committee of that body in 1899, accepting it, as he informed the writer, because he saw in this most important committee an opportunity for work.

The result of this work was soon made manifest. In his opinion there were many weak schools applying for membership, and some already in the fold that had no right to be considered satisfactory dental colleges. He pushed his investigations in this direction to the fullest extent, and was busily occupied in this field of labor when stricken by death.

While many will honestly differ from the course he pursued, no one but must accord to him credit for the highest probity and an ever-indwelling desire that dental education should be relieved of all the defects with which it is contaminated. Up to a certain limit the writer fully sympathized with this work, and was constantly brought into close relation with his aspirations.

He was courageous, oftentimes to the point of rashness, and this was markedly manifest in his last sickness in refusing at last to take an anæsthetic in the surgical operation to be performed, one of the most serious humanity is called upon to endure.

His death came to the writer as one of the most serious blows of his professional life. Dr. Menges was looked upon as one able and willing to sustain the highest standard possible in dental education. He would not listen to any compromise in this direction, and had he lived he would undoubtedly have created in the National Association of Dental Faculties a sentiment of far-reach-

ing character. Most men are influenced by some ulterior selfish motive, but this did not belong to Dr. Menges. His eye was ever turned to the light as he saw it, and with his impetuous nature obstacles were as nothing to its attainment. Such men are rare, and because of that rarity their departure causes a break in the ranks not possible to at once fill.

It is not difficult to do justice to such a character. His life was an open book to be read of men, but there was an undercurrent that few were privileged to see and feel. He was warm in his friendships and frank in his confidences, and the writer feels, as he parts with him upon the border-land of life, that he has lost one of the truest of companions, one of the most energetic of the true-hearted men devoted to dentistry, and one whose name will be enshrined in his memory among the few faithful devotees to that standard which leads unerringly to a higher professional life.

DR. GEORGE H. CUSHING.

THE death of this prominent member of the dental profession, while not entirely unexpected, has created a deep feeling throughout dental circles.

Dr. Cushing was born in 1829 in Providence, R. I. His father was for sixty years the cashier of a bank in the city.

After finishing his professional studies, Dr. Cushing went to California soon after the discovery of gold, and spent a year or two prospecting and mining. Returning thence, he came to Chicago about 1856, beginning the practice of his profession in partnership with the Quinlan Brothers, then the leading dentists in the city, succeeding to their practice on their retirement soon after.

Dr. Cushing continued the practice of his profession in Chicago until 1898. His office was destroyed in the great fire in October, 1871, but his house in Lake View was outside the burnt district. He leaves a widow, two sons, and two daughters.

Dr. Cushing's health was so impaired some two years previous that it necessitated a change of climate, and he removed from Chicago to California. This appeared to benefit him so much that he was able to attend the meeting of the National Dental Association held at Niagara Falls in 1899, and he was then ap-

parently restored to his usual health and spirits. His friends were, therefore, not prepared for the telegraphic announcement of his death.

Dr. Cushing's work has been almost entirely confined to Chicago as a practitioner and to his labors as secretary of the American Dental Association. He was an active member of this body from its earlier organization, and became its President in 1871, being elected to that position at White Sulphur Springs, and acting in that capacity at Niagara Falls in 1872. He was subsequently elected secretary, and filled this position to the great satisfaction of the Association until the final meeting of that body in 1897, and was then made secretary of the new organization, the National Dental Association, and continued in this service up to the time of his last illness.

It is probably true that but few men were better known in the dentistry of this country. While his work was mainly confined to the active duties of the associations with which he was connected, these were so important and so satisfactorily performed and so long continued that he became one of the chief standard-bearers of his profession, always to be depended upon to carry out his arduous duties with fidelity to the trust imposed upon him.

His personality attracted a large circle of friends, and probably few men would have been able to cover his manifold duties with less criticism. His friends were not merely such by name, but were closely attached to him by ties of a character few may be able to claim; and when sickness made him unfit for further practice these manifested their interest in ways that must have been a consolation in the closing period of his active career.

His life covered the most interesting period in the dental profession. He came into it at the transition decade, and, living to the last year of the century, he departed with the assurance that it had reached a standard beyond his or others' fondest anticipations.

While we mourn his loss as a friend and earnest associate, we feel that his example will live as an incentive to a younger generation. The curtain is being rapidly run down upon the life scenes of the older workers; one by one they are dropping from the active duties of life, but the lessons they taught must be our sure inheritance, to remain with us and be an inspiration to work worthily in their paths and extend these through the tangled under-

growth of, as yet, many unexplored regions to the clearer and unobstructed atmosphere of a higher professional life.

RESOLUTIONS OF RESPECT TO DR. GEORGE H. CUSHING, M.D., D.D.S.

It has come to the notice of the Chicago Dental Society that our beloved brother and fellow-practitioner, Dr. George H. Cushing, one of the founders of this Society, departed this life May 25, 1900, at Los Angeles, California; therefore be it

Resolved, That we mourn his loss as personal, because every member of the Society knew him and loved him as a friend, counsellor, and guide. This is no ordinary expression from a committee appointed to draw a memorial, but one where every member feels that it is a personal loss to no longer see and feel the presence of one so much beloved; be it further

Resolved, That in Dr. Cushing we mourn the loss of one who was in every sense an inspiration to do one's best in all the complex hours of life's duties. He was mentor, teacher, and helper in all emergencies. His life was devoted to his profession in a sense little understood by the thoughtless, and his influence for good was far-reaching and always to be relied upon.

We feel that in this feeble tribute to the vast labors he performed for forty years we fall short in our estimation of them because no one was more staunch in his devotion to private or public duties than our departed friend. He had his faults, but they were so obscured by his noble and gentle nature that few knew them; so they must be in an oblivion so perfect that only his most bitter enemy may recall them. For us he was the pattern of the kindly professional gentleman and devoted friend.

We extend to his family our condolence and the expression of our sorrow. We will all go to his last resting-place feeling that life is only a brief day and that we will meet him again in the near future, where all is peace and serenity.

Resolved, That a copy of this tribute be sent to the family of the deceased and to the dental journals for publication.

A. W. HARTMAN,
THOMAS W. BISHOP,
J. W. WASSALL.

DR. NATHANIEL WARE HAWES.

DR. NATHANIEL WARE HAWES, of Wrentham, Mass., one of the earliest active members of this Society, died at his residence in that town on Sunday morning, April 1, 1900.

Dr. Hawes was an honored member of the dental profession, and had practised dentistry in Boston since 1865. He was born in Wrentham August 12, 1838, in the same house in which he died. He was educated at Day's Academy in Wrentham, and studied his profession with Dr. George E. Hawes, of New York City. After this he graduated from the Harvard Dental School, and for a time practised dentistry in Wrentham and Foxboro. He was a demonstrator in operative dentistry, and was afterwards appointed assistant professor in the same chair in the school from which he graduated. Dr. Hawes contributed valuable papers to the literature of his profession, and was prominent in Masonic circles, as well as in public affairs in his native town. He was a man of great generosity and unlimited geniality of disposition. His unbounded hospitality is best known to us by the delightful outings that we had with him in his beautiful home in Wrentham. We shall miss his familiar face and the hearty grasp of his hand.

WHEREAS, It has pleased our Heavenly Father to take from us our honored member, Dr. Nathaniel Ware Hawes.

Resolved, That we, the Boston Society for Dental Improvement, desire to place upon our record our high appreciation of his professional standing; that we mourn his death as a personal as well as a professional loss, and desire to testify to our admiration for his efforts given at all times to advance the profession of his choice.

Resolved, That a copy of these resolutions be sent to his family, that they be spread upon the minutes of our Society, and that a copy be sent to the professional journals.

R. R. ANDREWS,
F. M. ROBINSON,
Committee.
H. S. DRAPER,
Secretary.

BOSTON, May 15, 1900.

Current News.

INTERNATIONAL DENTAL CONGRESS

A RECEPTION COMMITTEE, composed of the following-named gentlemen, has been appointed by the management of the international Dental Congress at Paris to look after the welfare of residents of the United States attending the Dental Congress: Dr. du Bouchet, *President*, 8, Boulevard des Capucines; Dr. Ronasell, *Secretary*, 74, Boulevard Haussmann; Drs. Barrett, Bogue, Crane, Daboll, I. B. Davenport, W. Davenport, Fay, Gries, Hotz, Lie, Levett, Mung, Georges Ryan, Jean Ryan, J. H. Spaulding, and Silva.

MISSOURI STATE DENTAL ASSOCIATION

THE thirty-sixth annual meeting of the Missouri State Dental Association will be held at Louisiana, Mo., July 10, 11, 12, and 13, 1900. A cordial invitation is extended to all reputable dentists to be present and participate in the proceedings, and become members of the Association. All railroads in the State have granted a one-and-one-third fare on the certificate plan. The Palmer House hotel rates are \$1.50 and \$2.00 per day.

Essays and Discussions.—Hon. Champ Clark, "Address of Welcome;" Dr. W. L. Reed, Mexico, "President's Address;" Dr. W. H. DeFord, Cedar Rapids, Iowa, "Necrosis, involving the Alveolar Process, Superior Maxillary, Nasal and Palatal Bones, resulting from Maltreatment of an Alveolar Abscess;" Dr. J. B. Chaffee, "Things I have noticed and other Things;" Dr. Ira B. Crissman, Chicago, "Relation of Dental Colleges to the Profession and the General Public;" Dr. Harry M. Hill, St. Louis, "The Material, Porcelain;" Dr. H. E. Zorn, De Soto, "Finished Dentistry;" Dr. M. D. Hamisfar, Warrensburg, "Bacteriology and Pathology: Their Relation;" Dr. John G. Harper, St. Louis, "Incidents in Practice;" Dr. H. H. Sullivan, Kansas City, "Open-Faced Gold Crowns;" Dr. R. C. Brophy, Chicago, "The Universal Tooth;" Dr. Charles L. Van Fossen, Kansas City, Subject to be

announced; Dr. C. D. Lukens, St. Louis, Lantern Lecture on "Orthodontia;" Dr. D. J. McMillen, Kansas City, "Preparation of Cavities and Filling with Non-Cohesive and Cohesive Gold-Foil" (with illustrations); Dr. J. T. Fry, Moberly, Mo., "Suggestions to the Young Practitioner;" Dr. D. F. Orr, Liberty, "Questions on Methods and Practice."

The clinics, beginning the second day at nine A.M., cover nearly all the operations in dentistry.

L. THORPE,
Corresponding Secretary.

ST. LOUIS.

NEW YORK STATE DENTAL SOCIETY.

At the annual meeting of the New York State Dental Society, held at Albany, May 9 and 10, 1900, the following officers were elected for the coming year: President, Dr. John I. Hart, New York; Vice-President, Dr. R. H. Hofheinz, Rochester; Secretary, Dr. W. A. White, Phelps; Treasurer, Dr. C. W. Stainton, Buffalo; Correspondent, Dr. H. D. Hatch, New York.

W. A. WHITE,
Secretary.

PHELPS, N. Y.

IOWA STATE DENTAL SOCIETY.

At the thirty-eighth annual meeting of the Iowa State Dental Society, held in Dubuque, May 1 to 3, the following officers were elected for the ensuing year: President, T. A. Gormly, Mt. Vernon; Vice-President, E. D. Brower, Le Mars; Secretary, I. C. Brownlie, Ames; Treasurer, W. R. Clack, Clear Lake.

I. C. BROWNLIE,
Secretary.

REMOVAL.

DR. WILLIAM BALDWIN KEYES, of Rio de Janeiro, has removed to 43, Queen Anne Street, Cavendish Square, London, England.

THE

International Dental Journal.

VOL. XXI.

AUGUST, 1900.

No. 8.

Original Communications.¹

PERSISTENTLY RETARDED TEMPORARY TEETH.²

BY DR. GEORGE S. ALLAN, NEW YORK.

MR. PRESIDENT AND GENTLEMEN OF THE NEW YORK INSTITUTE OF STOMATOLOGY.—My purpose in appearing before you this evening is not to read a paper, but simply to present a case; to give you such facts in regard to it as have come under my notice, something of its history, with what little I have been able to do to understand it, and to confess my general ignorance of the causes that brought about so abnormal a condition, and the many doubts and fears that have beset my path as to giving advice or attempting treatment.

I am not one of those who believe, with Pope, that "A little knowledge is a dangerous thing." On the contrary, I fully believe that a little knowledge is a mighty good thing to have handy for use; and I confess I am hungry for knowledge on this particular case, hence my bringing it to your notice.

I very much hope that, from the discussion that will take place when I have finished, or from the publishing of our proceedings, some valuable aid may be derived that will throw light on the

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, March 6, 1901.

subject and help me to understand it. If good results do not follow, then it will go to show that the case and all things appertaining to it are as rare and curious as they appear to me.

On April 1, 1897, Master A. B., eleven years old, was brought to my office by his father for advice and treatment. Let me say just here that the lad is in every way, mentally and physically, except in that which I will presently refer to, strong and healthy. He is well developed for his years, and his father tells me he stands well in his school. He loves fun and sport, and, for a boy, takes kindly to his work.

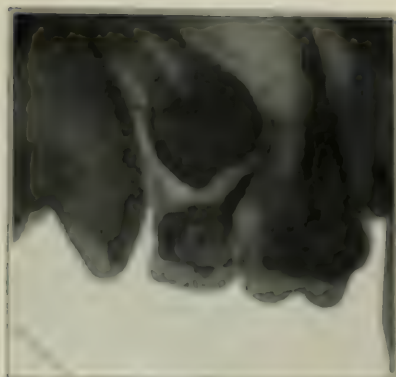
On examination I found that I had to deal with a case of almost complete retention of the first teeth, upper and lower. In the upper jaw all the temporary teeth were in their proper places, firm and strong in their sockets, the two central incisors only yielding slightly to pressure. Between the centrals, however, there was a supernumerary, and this extra was a little more shaky than its neighbors. Back of the temporary second molars there was enough swelling and enlargement of the gums to show that the sixth-year molars were pressing forward and might reasonably be expected to erupt at an early date. On the palatine border of the alveolar ridge of the upper jaw on both sides the swelling was very pronounced, so much so that the thickness of the ridge was apparently nearly double what it should be. The width of the jaw was slightly below the normal. The depth was, however, about correct. The probe indicated a thickness of about three-eighths of an inch of gum tissues over the sixth-year molars, but this could not be definitely determined.

The lower jaw presented a somewhat different state of affairs. The temporary incisors had been cast off, and the permanent centrals were about a quarter of an inch through the gum. The thickness of the alveolar ridge was not so marked as in the upper jaw, in fact, not enough to attract attention, and the left sixth-year molar was in place, but not fully erupted. The occlusion of both jaws was perfect. All the temporary teeth were healthy and strong, of a dense yellow color, and hardly at all impaired by decay. The erupting sixth-year molar was not so fortunate, and showed signs of imperfect calcification and breaking down of its grinding surface.

The speech of the boy was not much affected by the small palate and lack of tongue-room. Still it was noticeable. So far as I can learn, the boy's first set of teeth indicated no departure from normal



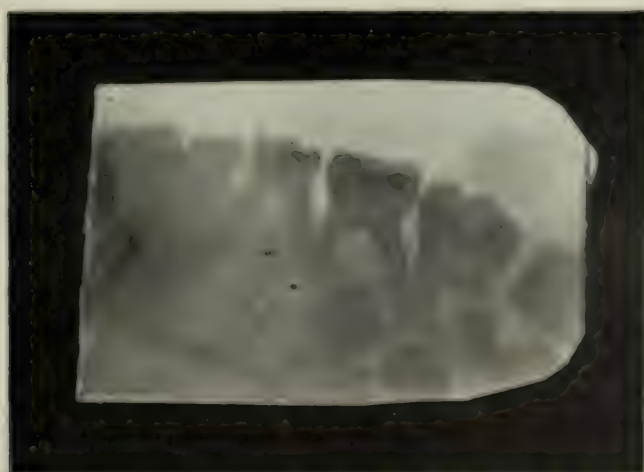
November 15, 1896.



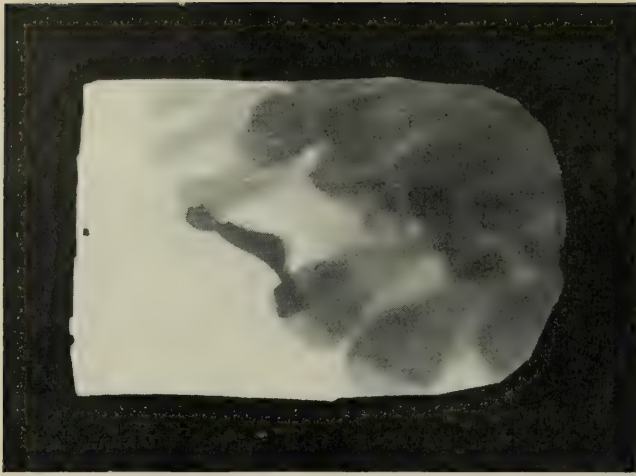
February 26, 1896.



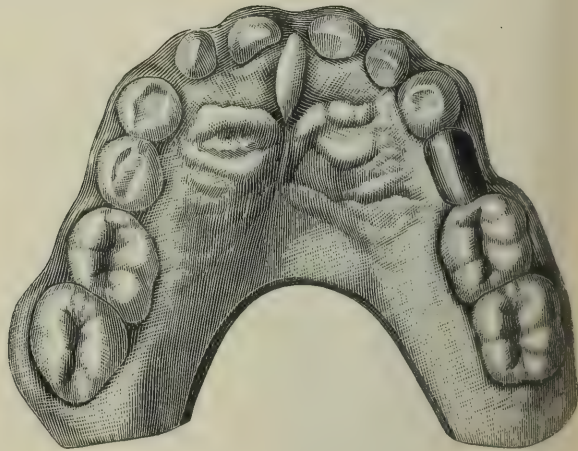
Apparatus used to draw out and inspect tooth.



Left inferior before preparation of first incisor, sealed.



Left superior after extraction of first temporary molar.



Superior jaw after extraction of first temporary molar and placing brace in position between temporary cuspid and second temporary molar to prevent contraction.

conditions. They came about the right time,—a little tardy, not much,—and the two centrals were cast off and the two permanent centrals took their place in the regular course of time, so much so that this period of dentition attracted no attention. In order to account for so wide and exceptional a departure from natural conditions, the hereditary possibilities were first inquired into. But little light or information of value was obtained. Nothing similar or of like nature, more or less removed, was found to exist in any member of his family. His mother has a supernumerary back tooth between the left superior second bicuspid and first molar, but no other deviations from natural conditions. The father, however, has a most pronounced protrusion of the upper front teeth, accompanied with occlusion of the lower front teeth with the soft tissues covering the alveolar ridge just inside the upper centrals, and this peculiarity he has transmitted, most unfortunately, to two of his children. One or more of his sisters, I hear, had like peculiarities, which were remedied in early youth, but in no direction can there be found any history of tardy eruption of either sets of teeth or undue retention of the first set.

Seeking further light in a different channel, one nearer at hand, certain prenatal conditions of the mother not usual were mentioned by the parents, and should be alluded to here as having a possible bearing on the solution of the problem. The more so as they were followed by other abnormal conditions in the child. I cannot say that any great reliance can be placed on them, still they are of interest, and some of you may think they have value.

As stated by the mother they are as follows: "When three months pregnant, the physician in charge suspected I had developed diabetes, and he insisted on my giving up all sugar, all starchy fruits and food, excepting bread only. I lived almost entirely on meat, eggs, and green vegetables; no dessert of any kind; only oranges were allowed, as they contained so little sugar. This diet was faithfully kept up until the child was born. He was a delicate baby, with an abnormal opening in his head, extending from the middle of the forehead to the back of the head. This closed very slowly year by year until the child was four years old, when it became entirely closed. The child cut his first teeth when he was seven months old; the other teeth came slowly; the last baby tooth was cut when he was five years old. He was born May 13, 1880, so he is now nearly fourteen years old and is cutting his sixth-year

molars." The above facts and data were given to me March 1, 1900.

No literature covering just such a case has come to my notice, so I make my report rather full in the hope that some one or more following me may find that it contains useful material, and that points of similarity may throw light on a difficult diagnosis.

I mentioned that the patient came to me first on April 1, 1897. Through some misunderstanding which I cannot explain I did not see him again till February 2, 1899. The parents thought I did not care to see him, for the reason that operative interference of any kind was impossible and a waiting policy only was proper. This was, in the main, correct, but not to the extent they thought. Nothing was done at first but make X-ray pictures. They were not very satisfactory, though they did show permanent teeth embedded in the maxillary bones and the roots of the temporary teeth of full length, with their fair proportions not in any way curtailed by the process of absorption. On the patient's second appearance it was evident that, left alone, no change for the better could be expected for many years, if ever. Nature unassisted either could not or would not give a helping hand. The two years of non-intervention left things practically as they were when first seen. Two more of the sixth-year molars had made their appearance, and the two lower centrals had increased their length to nearly full proportions.

The process of root-absorption was evident only by its complete absence, and the contemporary process of tooth eruption, while present, was painfully slow and tardy in commencing. All that could be done was a new effort to catch on to the case. New casts and X-ray pictures were made, and more consultations sought for. The first were helpful, but by no means decisive, and the latter only led to doubts and discord. One friend advised extraction and widening of the jaws; another said, "Let it alone; don't get into trouble." A third went over the whole ground, giving pros and cons, and came to the conclusion that he had no advice to give. Hardly any two gave the same advice or explanation. They agreed only in saying that they had never seen the like before or had they known of one having been reported. So, on general laws and principles, reliance only was to be placed with the added satisfaction of knowing that, whatever advice or course of treatment might be adopted, one would have to take great risks, and quite likely live to see the day when he would be sorry he had not advised and done otherwise.

After much study and thought and the placing before the parents of the possibilities of doing and not doing anything, I decided to have two teeth extracted and watch the result. The two left temporary molars were extracted on June 10, 1899, a few weeks before the boy, with his parents, sailed for Europe, to be away for four or five months. These teeth were extracted on account of their location being in the middle of the arch, and the probability that the first permanent bicuspsids would naturally be most advanced. Immediately after extracting, two small braces were made and cemented to the teeth on the opposite sides of the vacant spaces to prevent any contraction, which, if it took place, as was probable if left alone, would certainly complicate matters if not make them decidedly worse.

My opinion was that if the permanent teeth were given a chance they might and probably would slowly erupt, and that the probabilities were strong enough to make it prudent to extract two temporary teeth in order to test the wisdom of my theory. The malformation and possibilities resulting therefrom were too positive not to make some effort to remedy it.

On December 14, 1899, seven months after the extraction of the two temporary teeth, other X-ray pictures were taken and careful examination and comparisons made with those taken at earlier dates. The net results, while not wholly satisfactory, indicate that the theory adopted and acted on was fairly well founded. A slow movement forward of the permanent teeth was indicated; a rapid one was not looked for. What may happen in the future remains to be seen. Comparison was made at this time of the width of the arch with the earlier casts. This measurement showed that the width of the arch was increased considerably.—fully an eighth of an inch.

The diagnosis of this case appears fairly simple and easy, the etiology and treatment obscure and doubtful; but how about the prognosis? Let the treatment or non-treatment, interference or non-interference, be what it will, what data have we with which to work or to predicate results?

To me this question seems more than a Chinese puzzle, and the more I turn it over in my mind the more hopeless and far-away does the solution appear. One does not like to work wholly in the dark or too far on experimental lines. I said I had no record of a like case. I made a mistake, as the letter I will now read shows. In

essentials the two cases are closely related, but the pathological conditions of Dr. Howell's are wholly foreign to mine.

The heroic treatment adopted and carried out by Dr. Howell was, however, rewarded with the most fortunate results, which fully endorse the views that controlled my actions in the handling of my own.

FETOR FROM A DENTAL STAND-POINT.¹

BY B. HOLLY SMITH, BALTIMORE, MD.

MR. PRESIDENT AND MEMBERS OF THE ACADEMY OF STOMATOLOGY,—In the world of commerce, of sale and exchange, men buy and trade for what they want upon such terms as they can make. As a rule, the man who sells does not guarantee a profit to the man who buys when he comes to sell again. Yet even in this world the permanence of business relations between buyer and seller depends upon the ability of the seller to furnish an article upon the sale of which the buyer may make a living profit. Thus a more or less hard-and-fast system of interdependence exists, the wholesaler advising and conferring with the retailer as to the kind and quality of goods which he thinks best suited to the retail trade. In like manner the clerk in the retail store will advise the customer as to the quantity, quality, or color of goods required.

In the domain of professional life this dependence of one upon another, which is but faintly foreshadowed in the business world, becomes a fixed and definite principle. The patient, having selected his adviser, as a rule no longer seeks to protect his own interests, except by following the instructions of that adviser. The adviser must be honest, because he is trusted; his attentions must be helpful, because the subject is helpless. The doctor assumes parental authority over his patient, thus becoming a teacher as well as a practitioner; and just in proportion as those practising our specialty appreciate and live up to this high calling will we be regarded as discharging our full obligation to our patients, and taking our place beside other specialists of the great healing art. This contention—trite and old, if you please, yet bearing the spark of vital-

¹ Read before the Academy of Stomatology, March 27, 1900.

ity in that it seeks the perpetuation of the life and health of our calling—is my excuse for reciting in your hearing some clinical experiences which, let us hope, will help to establish the thought that the dentist is responsible not alone for the condition of the teeth, but for oral sanitation generally.

The olfactory sense may be regarded as one of the so-called *artistic senses*, and is capable of training and education. People of refinement in all ages have striven to avoid offending it, and not infrequently efforts are made to contribute to the pleasure of the individual through this sense. The delicate perfume of the flower appeals as much to the artistic sense through the olfactory as the coloring of the gracefully moulded petals do through the optics. So well established is this fact that women of refinement vie with each other in the effort to secure a slight though characteristic perfume for their garments, hair, and person. Some have gone so far as to endeavor to associate this perfume with their identity. It is said that whenever Mr. Browning—whose love passes everywhere for ideal—came into the presence of Mrs. Browning he was conscious of the faint odor of violets. And it is intimated that this was a psychic phenomenon produced in the olfactory sense by the extreme mental ecstasy caused by the presence of the adored.

Persons of refinement and culture, of beauty, grace, and good taste, should spread around them everywhere pleasurable impressions. How often do we see these charms negated, and social intercourse become burdensome because of a fetid breath.

To me there is absolutely nothing more beautiful than the human mouth in a state of perfect health, beaded above and below with the most ornamental and precious set of gems, whose beauty is partly concealed by the gracefully curved lips, the pink coloring of which serves to heighten their lustre, the cheeks, the tongue, the palate far back into the pharynx rose with the tint of health and glistened by the limpid libations of a generous though not too active salivary apparatus, while out and over these comes the expiration of a breath like that of a May morning, having the sweet, fresh, inimitable odor of health.

The treatment of fetor as the subject of a paper may not find favor in the eyes of those who recognize it only as a symptom of some disease and never as a special condition, the amelioration of which requires special care and treatment aside from that prescribed for the many conditions which have it for a symptom. To

these let me say that I have selected the subject partly because of the existence of fetor as a special factor in a number of cases of no little interest to me, partly because I think the dentist above any other specialist contributes to the amelioration of this condition, and more than all because I want to establish the contention that the patient must look to the dentist and make him responsible for such relief.

Even though the fetor has nothing to do with the mouth or the area usually included in the dentist's field of work, in the close contact which this specialist sustains to his patient he must be able to recognize its existence and should suggest the propriety of seeking treatment for conditions which the patient seems disposed to neglect. It must be conceded that while other specialists often direct their attentions to the amelioration of conditions giving rise to fetor, the dentist is the specialist most likely to detect its existence; and it appears to me to be his plain duty to determine its cause; if he can do so, to remove it, if not, he should direct his patient to the specialist best fitted to do so.

Fetor may be said to indicate always a departure from the normal, though its presence is not in every case coexistent with illness of a serious nature. Many persons seem oblivious to it, and medical attention is not always sought even when it is recognized. A mistaken sense of refinement often causes members of a family to conceal their knowledge of its existence from the sufferer, and when the patient becomes aware of it he is ignorant of its cause.

Among the conditions in which fetor plays an important part in determining the presence and progress of disease we may mention bromine, iodine, mercurial, lead, and phosphorus poisonings; caries of the teeth; loose or badly constructed bridges and crown-work; unsanitary plates and appliances; alveolar abscess, pyorrhœa alveolaris; various inflammations, specific and non-specific, of the mouth and appendages; fevers, constipation, diarrhœa; in fact, any departure from normal health and tone.

The mouth is lined by pavement epithelium, which is embryologically of the same origin as the epidermis of the skin, and therefore does not belong to the mucous membrane in the same sense as the lining of the stomach, bronchi, etc. There are numerous mucous glands in the mouth which open on the inner surface of cheeks, lips, and on the surface or beneath the tongue. The excretion of these is added to that of the salivary glands to make the

complete fluid of the mouth. Many substances, both mineral and alkaloidal, which are absorbed into the circulation are eliminated by these glands as well as the salivary glands, and in being secreted have their influence on the mucous membrane of the mouth. It is a well-known fact that mercury, after it has gotten into the circulation either through absorption by the skin from imunction or by hypodermic injection, is excreted by the mouth, and may give rise to a stomatitis just as severe as if an irritant were applied to the mucous membrane of the mouth. Thus is in accordance with the well-known law that substances which are secreted or excreted by mucous membranes act on those mucous membranes.

We notice that these drugs generally cause death to the superficial layers of epithelia, and of course dead epithelium is at once attacked by the saprophytic bacteria of the mouth, notably the *staphylococcus pyogenes foetida*.

Miller has shown that these dead epithelia and thickened mucous secretion scraped from a furred tongue show the presence of many rapidly developing organisms. It is only, however, when these organisms act on the dead epithelia and secretions in some little pocket, such as those around the teeth, in the valleculæ of the circumvallate papillæ, or in the crypts in and around the lingual and pharyngeal tonsil, where the air has not free access, that what occurs.

We find much the same phenomena occurring after the administration of some of the vegetable alkaloids, which are eliminated by the mouth. Atropine checks the secretions of the mouth, and, if pushed, is followed by furred tongue, etc. Other alkaloids also are excreted by the glands of the mouth, and in passing out act on the mucous membrane.

Now, I have no doubt that a similar explanation may be given for the furred tongue and bad breath occurring in many constitutional diseases, such as the fevers, etc. Modern investigation has shown that in the course of these diseases there are developed substances (generally the product of pathogenic organisms) called toxins, which are nitrogen compounds resembling in chemical construction and often in action many of the vegetable alkaloids; the greatest difference is that they are derived from animal instead of vegetable tissues. It seems to me much more logical to refer the furred tongue to the superficial necrotizing effect of these toxins during their secretion by the mucous membrane of the mouth than

to say it is in sympathy with the other organs of the body, stomach, etc. I do not believe it is a spreading of the condition of the stomach up the long œsophagus to the mouth so much as a simultaneous affecting of both by toxins secreted from the blood by the glands and epithelia of both.

Again, the furred tongue of constipation should be explained in a similar way. It is only one of the many evidences which the body shows of fecal poisoning, making its appearance here much sooner than in other portions of the body. It is not necessary to go into the subject of fecal poisoning to discuss what substances are absorbed from decomposing fæces blocked up in the bowels. Chemistry of the animal products, or physiological chemistry, as it has been termed, which has been developed so much lately since Vaughn extracted his tyrotoxicon from milk and cheese, has shown us that many of the phenomena of disease are to be traced to these products of animal matter,—namely, toxins in living bodies and ptomaines in dead.

Normal fæces contain, besides the residuum of digestion, substances which are excreted, or not intended for use in the economy, but are rather products which are deleterious; such as those in the bile, etc. Now, when the fæces do not pass out in a reasonable time, we have in addition the products of putrefaction, which are even more deleterious. These are absorbed into the blood and carried all over the body, and the mucous membrane of the mouth in eliminating them is affected thereby.

Now, what is the cause of the odor imparted to the breath? These cases of furred tongue in fevers, fecal poisoning, etc. We cannot suppose that such substances may be excreted by the mucous membrane of the mouth without causing a mild degree of stomatitis. Many of the epithelial cells become opaque and lose their vitality, the secretions of the glands are modified, and these conditions afford dead material, which the saprophytes, always present in the mouth, develop. Whenever there is a space where these grow and the air does not get free access, as in the valleculæ at the base of the tongue, the pockets between the gums and teeth, or even where the dead epithelia is so thick as to exclude the air from the lower layers, gases may develop and impart an odor to the breath.

Not infrequently the adenoid tissue known as the lingual tonsil is the seat of cheesy deposit or abscess, which gives rise to fetor.

The thick, ropy secretions which are often stagnant behind the folds of the velum palati, between the tonsils, or about the uvula, are often fetid. In the act of sneezing these are brought in the mouth, when the fetor is readily discovered. When the teeth are being cleaned with the brush, if the bristles be pressed for back on the tongue and palate, these secretions will be dislodged by gagging. Patients should be instructed to cleanse the mouth and appendages.

The following are some of the cases, the report of which it is thought might assist in making the application of the attempted teaching of this paper.

Miss M., cashier in a toy-store, had been in bad health for several months; trouble began with what was pronounced la grippe by the homoeopathic physician under whose care she remained. After much suffering and intermittent employment, the patient sought dental services for the relief of an aching tooth. On account of pronounced fetor a careful examination was made, suppurating antrum discovered, successfully treated, and patient restored to health.

A number of antrum cases could be mentioned where fetor was the pronounced symptom and where it assisted the diagnosis, but this case is cited because of the fact that but for the fetor the antral suppuration would not have been discovered and prompt relief afforded.

Miss B., who was under my care, was a very handsome and vivacious young woman. I noticed that in spite of the fact that her teeth were in good condition and the mucous membrane had a healthy appearance, her breath had a fetid odor. I called her attention to it so that we might co-operate in finding the cause. A superficial examination of the nasal cavities was made without discovering any cause for the fetor; the throat seemed normal. She was habitually constipated, so means were suggested for the relief of this condition, and she was requested to call in about two weeks. In the mean time I had a visit from her mother requesting that everything be done for the young lady which was possible. Upon her return, she reported improvement in habit, but there was the same close fetid taint to the breath. In a more careful examination of the throat and tongue, I noticed that the circumvallate papille on the dorsum lingualis were very prominent, and a spoon-shaped spatula scraped over this part of the tongue collected mucus of a most fetid character. With a delicate bistoury I cut through

one of these papillæ, and found by the side of it an accumulated mass of very fetid matter. Upon consultation with a friend, a throat and nose specialist, we decided to obliterate these fungiform papillæ with electric cautery, which was done with absolute relief of the condition.

A case in the practice of Dr. Cyrus M. Gingrich, of Baltimore: Miss P., a young woman of more than ordinary attractions, cultivated and refined. Members of the family complained that her breath was fetid; the mouth was in apparently healthy condition, teeth not responsible, tongue slightly furred, and mucus scraped from it offensive. A tongue scraper was advised, and the tongue cleansed with a weak solution of carbolic acid; after treatment a radical cure was effected.

A case in the practice of the late Professor Winder: Mrs. L., a lady of position and wealth, had been under the care of a throat specialist for six months, being treated for catarrh of the Schneiderian membrane, with little improvement. She was obliged on account of extreme fetor to forego social pleasures; conscious of the infirmity, she apologized profusely for having to subject her dentist and friend to the ordeal of attending to her teeth. A careful examination of her mouth revealed a pulpless bicuspid which was slightly tender to percussion. Its extraction was advised and consented to; a diseased antral cavity was found and restored to health; the patient, from being a recluse and invalid, once more resumed her position of prominence in her family and social circle.

Mrs. C., a woman of not very robust constitution, has been under my care for several years. A not very pronounced fetor was discovered at first sitting, and referred to the presence of an unusually large proportion of pulpless teeth; the four incisors and four bicuspids in the upper jaw were in this condition. A small fistula, open and empty, was discoverable near the frænum of the upper lip; looked to be an opening from the right central incisor. No examination of the nasal cavities was made at first sitting, as the patient was regarded as a transient, having only applied for specific operations upon molar teeth, two of which, in the upper jaw, were pulpless; there were also several teeth in this condition in the lower jaw. At a subsequent visit it was learned that the subject was under treatment of a specialist for nasal catarrh. A year after, this patient reported no improvement of special condition, general health not good; invalidism threatened, patient discouraged and

gloom; applied to have filling renewed in right superior second molar; tooth found to be pulpless, but pulp-cavity not exposed. Marked fetor was discovered upon opening; then it was found for the first time that some fifteen years previous a great deal of dentistry was done under the influence of a new obtunding agent; and whereas all dentistry previous to this was performed with a great deal of pain, this was done after treatment and without any pain at all. The arsenical "negro in the wood-pile" being suspected, all pulpless teeth were opened, and most of them found to be in fetid condition. A fistula was discovered in the floor of the left nostril. After a month's treatment fetor disappeared, and after a lapse of three years no more catarrhal symptoms have appeared, the patient is restored to health; the upper teeth, which were diseased and unsightly, have been bleached, and the woman is as sweet and handsome as she was in her fifteen-year-old form.

The fetor attending fractures is in proportion generally to the comminution, where specula or fragments are broken away; these frequently necrose, and quite a characteristic odor is developed. Added to this a fetor from accumulated *débris* about the splint is to be combated.

A fetid odor is often imparted to the breath from the socket where a tooth has been extracted recently. A partially erupted wisdom-tooth about the crown of which the gum is swollen gives a like odor.

I had a patient call for examination whose breath was most fetid. He apologized for it on the ground that his stomach had been out of order. I soon discovered a loose bridge to be the cause of the fetor, but being interested in his diagnosis, I asked him how long he had been suffering. He said that about a month before he had noticed the bad odor when he arose in the morning. He consulted his doctor, who, upon an examination of his tongue, said he would require some purgative medicine, which he took with abundant effect but very little benefit. Since that he had been undergoing a regular course of medicine for indigestion, with not much improvement. He was restored completely by a resetting of the bridge.

On several occasions I have had occasion to warn patients of mercurial salivation, the presence of which I was led to determine by the peculiar fetor associated with this condition.

Your essayist has found permanganate of potash a rock of de-

fence against fetor in all conditions, using it in weak solution, say one grain to the ounce, often having it decolorized by injecting it into suppurating cavities.

ACTINOMYCOSIS ABOUT THE MOUTH.¹

BY CHARLES A. PORTER, M.D., BOSTON, MASS.

MR. PRESIDENT AND GENTLEMEN,—I should not appear again within the year at one of your meetings if it did not seem to me that the subject of this paper was of great interest to you. In years gone by the dentist used to transfer alveolar abscesses, and similar processes about the mouth, to the surgeon for operation; now much oral surgery very properly comes into the province of the dental surgeon, and from our general hospitals more cases are referred to you every year for diseases of the jaw.

Though actinomycosis has been considered a relatively rare disease, it seems more probable that it is one which is very commonly overlooked. In its clinical aspects there is little that is characteristic. Though the course of the infection may make the surgeon suspicious, examination by microscope and culture is essential for a positive diagnosis.

The object of this paper is to attract your attention to the possibility that a proportion of the cases ranking as alveolar abscesses may be due to this specific organism, and by a few briefly reported cases to give you an idea of the disease as it affects the mouth, jaws, and neighboring regions in man. Statistics of the relative frequency of this disease are really of little value. In 1892 Illich, of Vienna, gathered only forty-two cases in man from all that at that time were reported. Dr. Rührah, of Baltimore, has published an article in the *Annals of Surgery*, 1899, in which he has collected all the American cases, seventy-two in number, occurring in all parts of the body. In the past two years I have been especially interested in this subject, and during eighteen months' work in the out-patient department at the Massachusetts General Hospital I have found eight cases of actinomycosis in

¹ Read before the American Academy of Dental Science, Boston, May 2, 1900.

about sixty so-called alveolar abscesses examined, and four cases have been found by other surgeons. Six cases of mine have occurred within three months, and four within one week; so we may conclude, I think, that the disease cannot be one of great rarity.

I will pass about some photographs of these cases, as well as a painting of the pus from the abscesses, which shows very well the gray or grayish-yellow granules which may be found in typical cases.

I. Joseph Craven, aged thirty-two; residence, Brookline Coachman. Entered out-patient department November 7, 1899.

Five weeks ago noticed a small lump on inner side of right lower lip; this grew larger, without marked pain, until two weeks ago, when an inflamed area was evident on the outside of the lip. Examination showed a red inflamed nodule, size of a five-cent piece, on right lower lip; the surrounding tissue was indurated to the size of a quarter; fluctuation was evident in the centre; no communication with mouth. Under cocaine a small incision was made on the inside of the lip; about half a teaspoonful of sero-pus escaped, with numerous granules, which showed the typical appearance of actinomyces under the microscope. Simple excision was advised, but the patient would consent only to a thorough curetting through an external opening; the surface was disinfected with peroxide, painted with iodine, and packed with iodoform gauze. In two weeks the small wound had almost closed with considerable induration at the base. No colonies could be found in the discharge.

December 15, five weeks after operation, only a soft red scar remained; no induration. Whether this infection started from the inside of the mouth cannot be determined; there were no carious teeth, nor any history of a wound. Many sections of the tissue were examined, but no colonies could be found.

II. William Cowan, aged forty-five; lives in Lowell, Mass. Entered out-patient department August 29, 1899.

Two months ago stuck a toothpick under his tongue, and could not remove the whole of it. One week after this the submaxillary region began to swell. The swelling was varied in amount; no pain; tenderness slight; no interference with talking, eating, or swallowing.

Examination: In the submaxillary region on the left side is an indefinite swelling about the size of a lemon; the skin is some-

what œdematous; at the bottom of the swelling is a small area where fluctuation can be made out; over this the skin is slightly reddened. There are no glands in the neck. Under cocaine a small incision was made. Sero-pus escaped, with a few grayish granules, which proved to be actinomycetes.

On the following day a more extensive operation was done under ether. Incisions were made about the involved skin, and the whole submaxillary region thoroughly cleaned from below upward. The submaxillary and a few lymphatic glands were removed with the mass. Just under the jaw a dense fibrous cord was found, extending upward to the floor of the mouth. Within this connective-tissue tube lay the remains of the toothpick lost two months before. This was removed, the flaps loosely sutured, and an iodoform wick placed to the top of the wound. Under daily packings and iodine the wound healed solidly in five weeks, without evidence of recurrence. This case shows well the common connection of actinomycosis with some foreign body.

III. Fred. Legg, aged sixteen, school-boy; residence, Cambridge. Entered out-patient department November 9, 1899.

Teeth have always been bad; has had five removed from upper jaw. Second left molar decayed for some time; two months ago a small lump appeared inside mouth about root of this tooth; this gradually grew in size, without pain, and appeared on the outside of the jaw ten days ago as a reddened semi-fluctuant swelling the size of a quarter, surrounded by a hard and firm border. Inside the mouth a distinct induration could be detected, as of a connective-tissue sinus leading from the tooth to the external swelling. There was moderate trismus; no pain; tenderness slight; no glandular enlargement. A small incision revealed several granules of actinomycosis. Under ether the edges of this wound were excised and the walls of the cavity cut away with scissors; the base thoroughly curetted and painted with iodine. No sinus could be found connecting with the tooth. The wound granulated slowly, but was healed by December 7, when there appeared on the outer side of the scar a small fluctuating area. This was opened and curetted; in the pus no colonies could be found after very careful search.

December 20.—The induration within the mouth still persisted, but by January 2 this too had disappeared, and there was then no sign of recurrence.

At operation many granules were obtained which varied in size from a pin-head to three times that size. There was considerable soft, cherry-looking material in the wall of the cavity. Pure cultures from this case were finally obtained by Dr. Wright.

IV. William Warren, aged thirty, West Everett; Gunster. Entered out-patient department November 13, 1899.

Five months ago noticed lump inside mouth opposite last molar teeth on right. This grew larger, and becoming very painful, he went to Emergency Hospital, where it was lanced, with immediate relief. In another month abscess reformed and face swelled to the eye. After lancing no further trouble until three weeks ago, when he noticed "pimple" on outside of jaw about the middle of horizontal ramus; this grew larger, with much swelling and pain.

On entrance the whole right side of the face and eye were much swollen; trismus was well marked; over the centre of the jaw was a reddened, fluctuating lump the size of an English walnut. The surrounding tissues were very hard and brawny. This induration ended very abruptly and gave place to general oedema; within the mouth is well-marked induration from first molar to wisdom-tooth.

Under cocaine the external abscess was opened and very numerous granules, a hundred or more, poured out, in thin sero-pus. Some of these were unusually large, almost the size of a very small split pea.

Under ether the infected skin was freely removed, with the base of the cavity down to sound muscular tissue. Again no sinus connecting with the teeth could be found. Closer to the jaw a small cavity was found containing thick, yellow, stinking pus. The wound was dressed as before.

Within three days the swelling had much diminished and the trismus was much less.

December 10, almost a month after the operation, the face suddenly began to swell again. Under ether an abscess to the outer side of the upper jaw was evacuated within the mouth; the pus was foul and contained many soft, yellow granules, appearing somewhat like actinomyces, but under the microscope proved to be masses of mouth bacteria and *leptothrix buccalis*.

Just back of the scar of the first operation a "crater" was found, which when opened allowed the little finger to enter nearly to the lower jaw outside of the last molar; the sinus was lined

with very dense connective tissue and contained foul pus. Here one or two disorganized colonies of actinomycosis were found.

January 5.—In three weeks the swelling and most of the induration had gone; the sinus was healed, and the patient in much better condition.

March 20.—Patient reported; no sign of recurrence; no induration; mouth opens normally; about the wisdom-tooth there is some exuberant gum.

In this case the focus of the disease was probably not reached until the last operation, and mixed infection undoubtedly played an important rôle. Pure cultures were finally obtained by Dr. Wright from the granules in spite of the contamination.

V. Herbert Grirow, aged twenty-two, 1113 Harrison Avenue.

October 10, 1899.—Five weeks ago, without toothache or external wound, a small swelling formed below the middle of the right lower jaw; there was little pain. It has grown considerably in size within the past few days. The skin is hardly reddened over it, but fluctuation is evident. From the upper part of the tumor a firm cord runs upward for one-half an inch; the whole mass is movable and seems rather superficial. Temperature 101° F.; pulse not elevated; teeth not carious. Incision showed the streptothrix colonies. Under ether the diseased skin was excised and the whole mass removed, with a small portion of the submaxillary gland which was adherent to it. No trace of sinus leading to mouth could be made out. The excised mass showed a central cavity surrounded by dense tissue, here and there infiltrated by small areas of grayish-red granulating tissue, containing the pearly granules; some of these show slightly darker centres. In the contents of the cavity were several black bodies, which under the microscope were seen to belong to some beetle. Whether this entered through the floor of the mouth and gradually worked down, or came from the tonsil or œsophagus, is not clear. A man could hardly get the body of a beetle into a wound of the face without knowing it. No history of any external wound could be obtained. Evidently the fungus entered with the beetle. The wound was soundly healed in two weeks.

VI. Mike Clarke, aged twenty, laborer, Cambridgeport. Entered out-patient department November 14, 1899.

Three years ago patient had similar lump in the same place, which broke and went away. This swelling began a week ago as a little round, painless lump.

Below horizontal ramus of right jaw is an oblong red swelling size of peanut, which fluctuates in the centre. From this to the level of the lip the tissue is firm, swollen, and boggy. There is also some swelling over and about the submaxillary gland. Trismus is well marked; can barely open mouth one-fourth inch. On opening the small superficial abscess, a thin, sero-purulent discharge appeared with several colonies; at a deeper level, three drachms foul pus was found, without actinomyces colonies. Apparently diseased tissue; curetted thoroughly, and cavity drained after painting with iodine. In a week the oedema had disappeared and the trismus was much less. Examination of the mouth showed that the three right molars were all carious. In three weeks wound soundly healed; normal motion of jaw.

March 18.—Two months afterwards another abscess rapidly formed, which Dr. Balch opened, and Dr. Wright found to contain two typical granules.

March 25 Dr. Balch kindly asked me to see the case again. Trismus was well marked. At the site of the old scar is a small sinus from which a little bloody serum comes. The scar is dense and firmly adherent to the anterior edge of the masseter. Under the jaw are two enlarged glands. Under ether I excised the mouth of the fistula with the surrounding skin. The wall of this sinus was surrounded by very dense connective tissue, which ended abruptly at the cavity, which was lined with soft, flabby granulations. Following along this sinus an inner cavity was found, the inner wall of which was formed by the periosteum of the jaw. From this another small sinus could be traced backward for an inch and a half to the base of the second molar tooth. The whole sinus and cavity was excised and the three carious teeth removed; iodine and gauze drainage; few stitches.

In the centre of the second molar tooth a fairly characteristic granule was found, but on microscopic examination this proved to be a mass of mouth bacteria. The sections have not yet been examined. The case is now entirely healed.

VII. John Smith.

Six months ago broke left lower jaw just anterior to masseter muscle. The bone healed, but whenever he got drunk he had soreness and swelling at the point of fracture. Once a little pus was discharged into his mouth. He came to hospital with a small fluctuating abscess just under the skin. On opening this the typi-

cal granules were found. The abscess cavity was thoroughly excised; no bare bone was found. In two weeks the wound was healed. There has been no recurrence. The natural diagnosis was necrosis after fracture; yet no dead bone was found, and thorough excision stopped the spread of the disease.

VIII. Patrick Sharkey, aged forty (Dr. G. W. W. Brewster's case).

For two years has had trouble with left molar teeth, which are carious. Has had several small abscesses opened inside the mouth. In January left side of face swelled and large abscess was evacuated. Since then there has been intermittent purulent discharge into the mouth, and jaw has been sore.

Patient entered on April 15. The left side of the face was much swollen; he could hardly open the mouth; in front of the masseter muscle, over the horizontal ramus of the jaw was a reddened fluctuating abscess the size of a walnut. This was opened and found to contain the granules.

Under ether the abscess cavity was dissected out, and a sinus found leading back to the second molar tooth; here a small piece of dead bone was found. The sinus passed between the jaw and the masseter muscle, which was also involved in the disease. The whole cavity was thoroughly curetted and cauterized, the bad tooth extracted. In ten days the patient had only a small sinus left, which was granulating in a healthy manner.

This case is a good example of the recurrent abscesses which occur until the disease has been thoroughly removed.

The infection seems to enter most frequently near a carious tooth, or is carried in by a foreign body through the mucous membrane of the mouth or pharynx. The process is essentially subacute or chronic, and the disease tends to advance by a sinus towards the skin. Infection is rarely pure, but is usually mixed with ordinary pyogenic organisms or mouth bacteria. It is rarely painful, and the accompanying pain, when it occurs, is due, I think, to the mixed infection. Clinically and under the microscope the disease is characterized by the formation of an unusual amount of dense connective tissue, which ends more or less abruptly at the periphery and infiltrates the adjacent muscle or fat. In the jaw the bone itself is rarely involved, in human actinomycosis, though it may be thickened from periostitis.

It would seem that this surrounding connective tissue could later become infiltrated by the growth of the streptothrix and break down. In all the cases I have examined the inner wall of the cavity shows a clearly cut line of demarcation between the connective-tissue wall and the lining flabby, soft, grayish-red, granulating tissue. Glandular enlargement is conspicuous in its absence, and when present seems to be due to mixed infection. Metastasis seems to occur through the blood-current and not by way of the lymphatics. In serious cases the disease may progress down the neck, into the antrum or through the base of the skull.

Though a definite connection cannot be always demonstrated, it would seem that a sinus at one time leads from the original site to the superficial abscess. In Clarke's case, for example, at the last operation such a sinus was found leading directly to the carious tooth.

Trismus, though often present, is no more characteristic of this disease than of other inflammatory affections, though if the masseter were involved in the dense connective tissue, the jaw would probably remain stiff for a long time.

It is rarely possible, I think, to make a clinical diagnosis of actinomycosis, recurrent abscesses, without necrosis; chronic, painless, subcutaneous abscesses about the jaw, evidently not connected with tubercular glands, would lead to a suspicion of this disease. If these fluctuating areas were surrounded by especially firm and hard connective tissue, and a sinus could be felt under the skin, if there was little oedema and swelling, perhaps a probable diagnosis could be made.

Examination of the discharge is of great assistance, but the mere presence of the so-called "sulphur granules" is not by any means conclusive, and no case should be considered as one of actinomycosis without competent microscopic examination. Small round masses of fibrin or tubercular debris sometimes stimulate a colony, in the mouth or adjacent regions. Round masses of mouth bacteria, or *leptothrix buccalis*, occasionally appear very like a true colony. Even under low powers the resemblance is very similar. Dr. Wright has kindly photographed for me one of these masses, removed from Clarke's tooth. It presents a radiating arrangement, but under a higher power is seen to consist of vast masses of bacilli and the large, thick, non-branching filaments of the *leptothrix buccalis*.

In examining for actinomycosis gauze sponges which absorb the discharge should not be used. All bleeding, when possible, should be stopped before opening the abscess-wall. Unless badly contaminated actinomycosis pus appears usually as a clear, perhaps blood-tinged, slightly syrupy, sero-pus. Placed on a cover-glass, the granules vary in size from a millet-seed to the head of a large pin. They are usually round, with a clear-cut periphery; the color is gray or grayish-yellow, often suggesting a small pearl; the centre is not rarely somewhat darker. The surrounding pus is non-adherent and the granules can be readily removed alone. Fluid should be examined *at once*, for these granules are found with great difficulty when the blood has once clotted.

With reference to treatment, two facts speak strongly, I think, for the self-limitation of the disease in the majority of cases.

1. Though it cannot be a rare affection, few cases enter the hospital with advanced actinomycosis of the jaw, and it seems therefore certain that many recover after simple incision of the abscess, and even through a natural rupture of it.

2. It is surprising to find, on microscopic examination of sections, how infrequently the colonies are found in the walls of the abscesses, though the pus contained many granules. The surrounding connective tissue probably proves an effective barrier to the spread of the disease.

Simple opening, curetting, and drainage have proved efficient in many cases; though recurrences may be frequent, healing eventually takes place. Where possible, excision of the inner half of the abscess-wall or sinus is the best treatment. The danger from swallowing the granules, where the discharge empties into the mouth, is hard to estimate. Certain cases of generalized disease, in the lungs, intestinal tract, liver, etc., occur in which the organism gained entrance through the food, or was swallowed, and therefore the surgeon should aim at making *external* drainage. This question is often a difficult one to decide. On the one hand, he wishes to avoid a scar on the face, especially in women; on the other, he wishes thoroughly to eradicate the disease; for with recurrence the scars would probably be worse than from a single, thorough, and clean operation. The individual case and the severity of the infection must determine the choice between curetting and cauterizing the cavity with tincture of iodine or carbolic acid and a more radical excision.

Iodide of potash, in doses of twenty grains three or four times a day, has distinctly influenced some cases for good, and should be used in connection with the local treatment.

Finally, I trust that when your attention has once been called to actinomycosis of the jaw, you will be enabled, through this brief paper, to make an early diagnosis of the disease, and I feel sure that a careful examination of chronic alveolar abscesses will show that the streptothrix actinomycotica is the cause of perhaps one-eighth or one-tenth of them.

SANITARY CONDITION OF THE MOUTH AND TEETH, WITH A BUSINESS METHOD OF OBTAINING THE SAME.¹

BY DR. LEVI C. TAYLOR, HARTFORD, CONN.

THE suggestions offered for your consideration this evening are based upon principles and facts with which you are all more or less familiar, but I desire to make their practical value more apparent.

Webster defines the term *dentist* as "One who cleans, extracts, repairs, or fills natural teeth and inserts artificial ones." The later editions conclude by pronouncing him a *dental surgeon*.

Harris's Dictionary, of 1867, under the head of Dental Surgeon, says, "He is one who devotes himself to the study and treatment of the diseases of the teeth and their connections."

The last definition suits our purpose, as it better describes the thought when we refer to the sanitary condition of the mouth.

That there is disease in a very large percentage of mouths at the present time it is not probable any will attempt to deny. Whether the cause is higher civilization, the use of soft foods, or is produced by a large combination of circumstances, we will not here attempt to discuss.

That it is the duty of us who assume the responsibility, to care for the mouths of our patients in the best manner, we all believe. It seems fitting, as honest and conscientious men, that we should

¹ Read before the Academy of Dental Science, May 2, 1888.

be well prepared, and up to the teachings of our best minds. We should seek to establish a scientific truth for ourselves.

Science Dr. Elliott would probably define as "systematized facts."

If we find one or more facts that can be demonstrated at all times, we have a right to speak of the discovery as scientific; and such I believe to be the case in the practically new method of dealing with our patients.

In the teachings of the late Dr. Riggs, thirty and even forty years since, he said that if we would clean teeth well enough and as often as circumstances required, there would be no decay. Dr. Riggs was a man of more professional than business ability; consequently, he almost failed to procure for his patients the valuable results his ability seemed to indicate.

Our Andrews, our Black, and our Americo-English Williams have repeatedly shown us on the screen many fine pictures of the microbes that exist in the mouths of the human family, proving beyond question that they are present in great abundance. As far as I am aware none have given a practical suggestion how to rid ourselves of the injury of such infections. While we are fully convinced that such myriads of germ life exist, it is very apparent they are fed and nourished to a more mature form by the numerous irritations that are allowed to remain on and around the teeth. The erosion then forms sufficient to give them a good foothold beneath the enamel and until the little tendrils are sent out penetrating the tubuli. The general health structure is broken down, and then we have what is called decay.

Treating decay has attracted our attention for many years, probably being, in most men's hands, more remunerative than the earlier prophylaxis, which should be considered for the good of our patients, and, when considered rightly, may be pronounced for our good. When our patients derive a benefit at our hands, they are usually willing to share that benefit with him who is the giver.

I wish here to comment on the teachings of our schools. The first year is devoted to anatomy, physiology, and chemistry, with such infirmary practice as the cleaning of teeth. I will venture to say that the students of many schools do not average to clean one set of teeth a week, and many not more than two or three during the term.

Right here allow me to ask the question, How much time is devoted to the proper teaching of the sanitary condition of the mouth? Ask yourselves this question, How much time was devoted by any member of the faculty or superintendent of the infirmary when you were a student? and you will be surprised at the inattention, aside from the occasional assignment of a patient, allowing you to practise as best you could.

Few of the schools seem to pay much, if any, attention to this beyond the first year. The second year the student has attained sufficient dignity to make amalgam fillings, and the third year he has reached the golden age. The fourth year he has obtained his degree, but is not supposed to consider such a humble occupation as the cleaning of teeth, except when called upon especially for such service, when the teeth are whipped over five or ten minutes with the engine, and the doctor passes on for another golden nugget. I once heard a D.D.S. remark to a student that "Any fool could clean a set of teeth." I very soon learned that he who made the remark had never learned the first rudiments of cleaning teeth with any thought for the sanitary effects. He simply rubbed off the faces that they might look a little better. Such cleaning is absolutely harmful, for it deceives both patient and dentist and leads them to think they have the teeth cleaned while all the harmful part is left lurking between the teeth and under the gums, where it is best suited to do its deadly work of destruction.

I believe in the modern dental engine, and consider it an absolute necessity for many parts of our work, but I have never seen a case bearing good results in the line of thorough cleaning of the mouth when it was used. It is simply a delusion, for it does the work open to the eye with such apparent satisfaction that we fail to go up under the gum with our orange-wood and pumice to complete the operation beyond criticism. Hand-cleaning has been proven to be the only thorough method in that line.

As regards the time necessary for cleaning a full set of teeth, thirty minutes is the minimum, when everything is favorable. As the complications increase, it will extend into hours of hard, laborious, nerve-exhausting work, for which the practitioner should be compensated at a higher fee per hour than for ordinary filling, as it is many times more valuable when considered from a pathological stand-point than any of the more common operations.

It seems desirable that our teachers of pathology should sexual

their time and instruction to the infirmary, and there demonstrate the results that may be obtained from modern prophylaxis.

Many of our practitioners get much information (such as it is) from the drummer who has learned for what purpose a particular instrument is designed, and he imparts such knowledge as best he can, that he may extend his sales. We are all more or less afflicted with the sample fiend, who has some wonderful germicide which he wishes us to try, guaranteeing that it will cure every known disease. He is not content with the declaration that the remedy will remove the tartar and green coating on the teeth, but he goes further, and says it will cure every known form of toothache.

How far the hypnotic suggestions of our sample men have aided in the efforts that are being put forth for more perfect sanitary results I am not able to judge. That there is such effort being made by many and in many different ways I do believe.

It is costing the profession two generations of persistent instruction to counteract the effects of such teaching as was demonstrated by the ancient practitioner, whose sole remedy for all pathological disturbances was the forceps.

Many people to-day are wearing artificial dentures, greatly to their discomfort, as the result of improper instruction given their ancestors, possibly two or three generations ago.

Here I wish to state that it is much more difficult to fully vindicate our prophylaxis theory when a partial plate is worn, as so few will keep the plates and teeth as clean as is desirable.

You will notice I have not referred to this matter under the head of Riggs's disease, or pyorrhœa. It is better to stimulate an interest in the prophylaxis theory; and as each of us becomes thoroughly enthused over the results of these cases which we are *able to make successful*, we will feel our way on into the advanced cases with a better understanding of how far we can attain success. Too many failures have been made already by attempting to care for cases in advance of our actual knowledge as a pathologist or manipulator.

Dr. D. D. Smith, of Philadelphia, has taken great interest in producing the best results for his patients. He has been experimenting for six years along the line of prophylaxis, with such success as to have convinced several of our Philadelphia friends, who have told me personally that what he claims is true, for they have demonstrated his theory for themselves.

Dr. Smith has written some excellent articles on the subject of prophylaxis, one of which was published in the *INTERNATIONAL DENTAL JOURNAL* and afterwards copied into the *Dental Digest*. Another is soon to appear in the *Dental Digest*. It is not my purpose to dwell on what is contained in that article, for you can have the pleasure of reading it yourselves. It was my privilege, a little more than a year ago, to stand beside the dental chair of Dr. Smith and to have him explain each one of many cases which have been under his care for several years. I noted the practical methods that were used to bring about most excellent results.

I was interested, yes, delighted, with what I saw and heard.¹

For more than thirty years I have been a great admirer of fine dentistry, especially the general results that have been attained, but never have I seen anything like this.

Dr. Smith informed me that he had never been able to fully obtain such results until of late years, for he was never able to have the full control of the mouth, as, he said, patients would at various times allow little matters to defer their appointments indefinitely, until the benefits he so much desired were lost.

He conceived the idea of making a yearly contract with the patient for a certain sum of money to be paid annually whether present or not, the only stipulation being that the patients should present themselves regularly each month for him to polish and massage the teeth thoroughly, at his discretion, he guaranteeing immunity against decay,—the mouth being put in perfect condition at the outset,—working on the theory that when the tooth surface is well polished no decay will take place.

The massaging will so stimulate the teeth that it in part makes up for the lack of use which nature designs.

After seeing these things, and the results that followed, I became so elated that on my return I took two of the worst mouths I had in my practice and commenced seeing the patient each month, following along the line suggested by Dr. Smith, and the results are more gratifying than I had dared hope for.

One patient told me, the other day, that she had never been half the time before without having teeth filled, and, said she, "I

¹ One good Quaker lady leaned forward, as the doctor was showing her mouth, and told me, with the usual Quaker modesty, "O. is the best thing I have found in dentistry."

do not dread to come to see you any more than I dread to go down-town shopping."

The other patient told me that she really enjoyed having her teeth massaged and polished.

I now have some fifteen patients on this basis, several of whom would be willing to pay double the fee charged rather than go back to former methods.

The gums become a beautiful, healthy pink, rigid and hard, and you can crowd up under them with the orange-wood and pumice almost harshly without discomfort to or resistance from the patient.

The wisdom of this practice becomes more apparent every day, and with such success attending it, is it not reasonable that one becomes enthusiastic?

Abstracts and Translations.

THE NECESSITIES OF A MEDICAL SCHOOL.

BY W. W. KEEN, M.D., LL.D.

[The following brief abstract of the very able address delivered by Dr. Keen, as President, before the American Medical Association, recently held at Atlantic City, contains a forcible statement of facts connected with medical education, and these are equally applicable to dental college work, although in practical training dentistry has long been in advance of medicine.—ED.]

"WHAT were the necessities of a medical school twenty-five years ago? Two lecture-rooms, in which seven professors talked, a dissecting-room, and, if possible, a clinic, which was occasionally, but rarely, in a college hospital. Practically the instruction which the student obtained, with the exception of dissecting, was limited to 'book-knowledge' and 'ear-knowledge.' The student was not brought into contact with any patients or any concrete facts, observations, or experiments. He only listened to what his teachers

said about them. Millions were given to hospitals in which the sick were treated, but only sixpences to medical schools, in which the men who were to care for their future patients were trained. 'Spain,' says Lyman Abbott, 'in the late war had nineteenth-century guns and sixteenth-century men behind them. We know what came.' Our splendidly equipped hospitals are the nineteenth-century guns. Insufficiently trained doctors are the sixteenth-century men. The time has certainly come when the 'man behind the guns' must equal in efficiency the weapons with which they do the fighting.

"To perform a tracheotomy and rescue a child suffering from diphtheria is a dramatic occurrence which appeals to every one. To conduct a long series of experiments in the laboratory, by means of which the cause of diphtheria shall be found and the necessity for a tracheotomy avoided, appeals only to the educated few; yet the service done by the operation is a service only to the one patient who may be rescued by the knife, while the other is a service to hundreds and thousands of patients who, for all time, will escape both the knife and the disease. Yet such a series of experiments in preventive medicine brings no reward in money, a limited reward in fame, and only its largest reward in the consciousness of giving a great boon to humanity, for which it never can pay.

"The era of the man who simply listened to what his teachers had to tell him and then went on his way as a 'rule of thumb' man is happily past. This is the era of the trained man and the trained woman, and training means opportunity provided by the community and time, labor, and money given by the man.

"Let us look for a moment at what a medical school now needs. It stands for two things: 1. 'Thing-knowledge' instead of 'book-knowledge' and 'ear-knowledge,' teaching the facts of modern science by scientific methods; that is to say, methods of precision. But, 2, no medical school should be content simply with imparting the knowledge that exists. It should push back the boundaries of ignorance and by research add to our existing knowledge.

"In the accomplishment of the first duty of the medical school there are required, first, didactic lectures. I am not one of those who believe that the day of the didactic lectures is past. 'Never,' said President Faunce, of Brown University, in his notable inaugural, 'never shall we be able to do without the personality of the

teacher, flaming with enthusiasm for knowledge, pressing up the heights himself and helping the student on.'

"In the one hundred and fifty-six medical schools in this country there are, perhaps, over fifteen hundred members in their faculties. In all of them are inspiring teachers flaming with enthusiasm, for a not inconsiderable proportion may properly be so described, and the influence of such enthusiastic teachers is felt by the entire class. One or two such men in every school make a good faculty.

"Besides the didactic lectures, a good working library and a reading- or study-room is a requisite. And it is a matter of no little encouragement that in the reports of the United States Commissioner of Education for 1898, seventy-two medical schools reported one hundred and fifty-one thousand four hundred and thirty-three volumes in their libraries.

"The great difference between the modern method of teaching medicine and the older method consists in *laboratory instruction* and *clinical instruction*, both of which must be individual. Laboratories are very costly. They require buildings, equipment, and assistants. The number of laboratories required in the present day in a fully equipped medical school is astonishing. First, the dissecting-room,—the anatomical laboratory,—and along with this a laboratory of histology, and another which may be combined with it, a laboratory of embryology. Next, a physiological laboratory, in which each student will not become an accomplished physiologist, but will become familiar with physiological methods and be trained in exact and careful observation; a laboratory of chemistry and, combined with it, especially, a laboratory of physiological chemistry; in the department of materia medica, a laboratory of pharmacy, where the student will not become a good pharmacist, but will learn the essentials of pharmacy so that he will not make, at least, gross mistakes, which, otherwise, would constantly occur. Still more important is a laboratory of pharmacology, in which he will learn the action of drugs and be prepared rightly to use them. In obstetrics, a laboratory of practical obstetrics and obstetric operations is essential. In surgery, he needs a laboratory in which he shall be taught all the ordinary surgical operations. In pathology, he needs a laboratory of morbid anatomy, a laboratory of bacteriology, and a laboratory of hygiene. The mere statement of this catalogue of thirteen laboratories will enforce the fact that enor-

mous expense not only for the installation, but also for the running expenses, will be required. To show what one university abroad does, Professor Welch has stated¹ that the Prussian government expends, outside of the salaries of professors in the University of Berlin alone, over fifty thousand dollars annually. What American medical school can show anything approaching an endowment which will provide such a sum?

"And what has not the laboratory done for us within the last few years? It has discovered the cause of tuberculosis, tetanus, suppuration, cholera, diphtheria, bubonic plague, typhoid fever, erysipelas, pneumonia, glanders, and a host of other diseases; it has shown us how to avoid all danger from trichina, so that our entire commerce in hog-products is conditioned upon the laboratory; it has shown us how to banish suppuration, erysipelas, tetanus, and pyæmia from our hospitals and reduce our death-rates after operation from fifty or thirty-three per cent. to ten per cent., five per cent., one per cent., and often even fractions of one per cent.; it has given us a really scientific hygiene in which we no longer guess, but know; it has shown us the rôle of the mosquito in malaria, of the rat in bubonic plague, of the fly in typhoid fever; it has given us the power to say to diphtheria, 'Thus far shalt thou go and no farther;' it will give us the power to utter a psalm of victory over typhoid, cholera, bubonic plague, tuberculosis, yellow fever, cancer, and other implacable enemies of the human race,—and yet there are those who would stay this God-given hand of help!

"And the laboratory has had not only its *deserves*, but its heroes. Listen to the story of but one. Dr. Franz Mäller, of Vienna, was one of those who in his investigations of the bubonic plague in 1897 contracted the dreaded disease from the bacillus in his culture-tubes. When he became certain that he was infected he immediately locked himself in an isolated room and posted a message on the window-pane, reading thus: 'I am suffering from plague. Please do not send a doctor to me, as, in any event, my end will come in four or five days.' A number of his associates were anxious to attend him, but he refused to admit them and died alone, within the time he predicted. He wrote a farewell letter to his parents, placed it against the window, so it could be copied

¹ "Higher Medical Education and the Need for Its Endowment," *Medical News*, July 21, 1894.

from the outside, and then burned the original with his own hands, fearful lest it might be preserved and carry the mysterious germ. Can you find me a finer example of self-sacrificing altruism? Was ever a Victoria Cross more bravely won?

"But the establishment of laboratories, with their attendant expenses, is not the only improvement in our medical curriculum. Every well-conducted medical school requires a large hospital in connection with it. Here must be installed again a fourteenth laboratory of clinical medicine in which all the excretions of the body will be examined, tumors studied, cultures and blood-counts made, or else the patients in the hospital, from the modern point of view, are neglected. It is not too much to say that a patient requiring such examinations, be he the poorest of the poor, has his case more scientifically studied, more exactly measured, more precisely treated than most rich patients in sumptuous houses.

"Again, the individual instruction to which President Eliot referred is now carried out in all of our best medical-school hospitals by the establishment of small ward-classes, by whom or before whom the patients are examined, prescribed for, and operated upon by the professor or instructor, each student bearing a part; and so, by having his investigations directed, his powers of observation cultivated, his mistakes pointed out, his merits applauded, the student graduates from the medical school equipped as none of us, alas! ever had the opportunity to be. All of these laboratory and ward-classes imply an enormous increase in the number of assistants, young men striving not only to perfect themselves, but, by teaching, to forge to the front so that the best men will win in the struggle for preferment.

"Again, the course of study has been prolonged from two years, as it was twenty to twenty-five years ago, to four years, and in addition the terms have also been lengthened. When I was a student the course of study consisted of two sessions of about nineteen weeks each, or thirty-eight weeks in all. Now the course consists, as a rule, of four sessions of thirty-two weeks each, or a total of one hundred and twenty-eight weeks, an increase of ninety weeks, nearly three and one-half times as much as it was twenty-five years ago. In 1885, one hundred and three schools had courses of two years, and five schools courses of three years. In 1899, two schools had courses of two years, ten of three years, and one hundred and forty-one of four years.

"It can be easily seen that from this additional time required another source of expense has arisen besides the increased number of assistants. The time given to teaching by members of the faculty, as a rule, has been more than tripled, as compared with twenty-five years ago. In addition to this, professors in charge of laboratories must practically give their whole time to the work, and are precluded, therefore, from any income from practice. These men must receive salaries sufficient for them to live on.

"Surely this statement of the difference between the education given twenty-five years ago, which required but little expenditure of money and resulted in considerable incomes, and the modern methods of education in the laboratory and the hospital, as well as the lecture-room, which require enormous expenses, is an ample reason for large endowments."—*Journal of the American Medical Association.*

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the New York Institute of Stomatology was held Tuesday evening, March 6, 1900, at eight o'clock, at the office of Dr. William E. Hoag, 8 East Forty-third Street.

The minutes of the previous meeting were read and approved.

The President.—We have with us this evening, gentlemen, Dr. Learned, of Northampton, Mass., who will address the meeting upon "A New Method of inducing Sleep without Drugs."

(For Dr. Learned's paper, see page 462.)

Dr. J. B. Learned.—I cannot say too often that I hope by the end of this century we shall learn to sleep without drugs. Asking questions was to be a portion of this paper, and very likely the most important part of the exercise.

The President.—You will kindly accept Dr. Learned's invitation to take part in this exercise. It is doubtless a subject that interests us all.

Dr. R. H. M. Daubarn.—Mr. President, I appreciate the courtesy of being asked to discuss the paper. It certainly brings to remembrance the importance of inducing sleep as much as possible.

We all know that when we are asleep the brain is more nearly devoid of blood than at any other time; and therefore anything that tends to draw blood from the brain to another part of the body is beneficial for this purpose. This is chiefly the explanation of the method we have just heard so lucidly explained. A plan that has stood me in good stead,—acting in a similar way,—and one that is much practised among our English friends, who as a nation are excellent sleepers, is the habit of having a late meal at, say, ten o'clock at night. It is so useful in this respect that in the course of nineteen years as a physician I have many hundreds of times advised it among my patients, and have never had occasion to regret it. Of course, I do not mean a hearty meal, but a cup of warm milk, bouillon, chicken or oyster broth, or anything of that simple sort, which will not require an effort for its digestion; and the results are most excellent. By this means the blood is drawn from the brain to the stomach, and accomplishes the same result as the physical gymnastics to which our attention has been called. Some take plain hot water, but there is not enough substance in that to effect the same purpose for a sufficient length of time, at least with most people. Those who have trouble in sleeping are often people who have from necessity had to do a good deal of night-work. If not from necessity, they have at least done some hard thinking shortly before retiring. Hence the brain-cells have been in a very active state of vibration, and with difficulty calmed down. Anything that tends to mental activity in the evening is a mistake for one who sleeps badly. Some people ought never to take a cup of coffee, even at breakfast; for the stimulus producing mental activity will be maintained even into the following night. This I have seen time and time again.

Dr. Learned.—Mr. President, I neglected to say that I sleep in the open air. In my own room, at the head of my bed, are two open windows, so that by stretching out either arm I can feel the moving air, for the windows are open three hundred and sixty-five nights in the year. In an adjoining room my son slept where the open air blew over him the whole night long, during all his early life. Accustomed to it, we ride in the open trolley with a brisk breeze at nine or ten o'clock in the evening in September as well as in the summer-time, and, well wrapped up, we all enjoy it. This is true in Northampton; I hope it is equally so in New York. I believe it is essential to have good air at night as well as in the daytime.

I was in the Tubercular Sanitarium at Rutland, Mass., recently, where the windows were kept open at night in this way. The patients were allowed to have them closed while they were preparing for bed, and when they were ready the windows were opened. Every bed was under an open window. There were two hundred tubercular patients. Open air, food, physical exercise, and sleep were the antitoxins there.

We have heard of the English mode of eating at night, and I wish we could practise it with as much impunity on this side, but the American people are a class of dyspeptics, and while I agree with you that a meal would draw the blood from the brain to the stomach, you will agree with me that large numbers of people would suffer from this treatment, already having eaten a surplus, and that a more valuable method would be to walk five or eight miles per day. All the physical powers are called into action by this means, and you are helping nature to perform better her part while the owner remains at his tasks in his normal and proper condition, so that, while I think it would be justifiable in some cases, it would not be in the majority.

Dr. Daubarn.—Mr. President, I wish to say that I have recommended that method of promoting sleep any number of times, and have never known it to have bad results, but the very reverse of such. Of course, I do not mean a hearty meal, but a cup of warm milk or bouillon will not hurt one. I certainly wish to add that I do not think it at all new or theoretical, but a very old and very practical prescription. Here in New York it is standard advice in our profession.

Dr. F. Milton Smith.—Some time ago I heard a paper by Dr. Fillebrown, of Boston. He suggested at that time a remedy for sleeplessness, which was to confine the thought if possible, and if the thought could be confined one could go to sleep. He suggested that the word "sleep," repeated over and over, positively concentrating the mind on the one thought, would almost invariably bring relief. I have tried it for the past two years, almost invariably with success.

The President.—The next thing that should occupy us this evening is a paper by Dr. Allan, upon "Persistently Retarded Temporary Teeth."

(For Dr. Allan's paper, see page 509.)

The Secretary read the following letters:

A SHORT SERIES ON DELAYED DENTITION.

DISCUSSION OF DR. GEORGE S. ALLAN'S PAPER.

In compliance with Dr. Allan's request for information and data relative to practical cases of delayed permanent dentition and their treatment, I submit the following brief account of three cases, all of which differ widely in nature.

Case I., illustrated by lantern slide No. 1, is a case where the abnormally late development characterizes one tooth only, the others having erupted at about the normal time. It is the right superior cuspid of a boy aged seventeen. The deciduous cuspid is yet very firm, and the permanent is advancing on its dorsal aspect. There is apparently no good cause for the condition. The treatment is negative while waiting to see what nature will do in one year, when another radiograph will be taken.

Case II. represents a condition of delayed dentition of all the superior bicuspid, and cuspids and molars, illustrated by slide No. 2. The patient is a girl aged twelve, in good health. The incisors, superior and inferior, erupted at seven to eight years. She suffers a serious superior protrusion. A possible explanation for the delayed development is found in the history in that she was continuously ill from three and a half years of age to about seven. The ancestral history is wanting. The radiographs demonstrate the condition with great clearness. The treatment for the present will be to make radiographs frequently to ascertain the rapidity of development.

Case III. is very complicated. It is illustrated by Fig. 3. It represents two extremes of development side by side, besides a serious malposition long before eruption. The child, a girl, is eight and a half years of age, and suffers a serious superior retrusion, which obtains also in her father. Singularly the permanent cuspids of this side are almost completely erupted. The left side is perfectly normal. When she presented, about a year ago, she was shedding the first deciduous right superior molar by the natural eruption of what was supposed to be the first bicuspid, but which soon developed to be the cuspid. The deciduous cuspid anterior to it, which stood firmly, was immediately extracted. In the mean time the superior centrals and laterals were all protruded. The inferior arch developed so much faster than the superior that radio-

graphs were taken to ascertain the cause, when it was found that on this right side only one bicuspid was developing, and it was seriously malposed, its long axis being about forty degrees out of its proper course, and it is rotated nearly half-way round. Its direction being inclined backward, it has advanced against the mesial surface of the first permanent molar, and is actually causing the absorption of the mesio-buccal root as seen by the radiographs. It is literally wedged between the cuspid and the first permanent molar, and if allowed to advance as best it could, its lingual-cusp would probably become quite firmly locked under the mesial marginal ridge of the molar.

This condition was discovered last November, and it was decided to see what nature could do to correct the condition, and accordingly three months' time, or nearly, was given between radiographs to determine this. On February 13 the radiograph seen to the left was taken under as nearly as possible the same conditions of tube, angles, and distance, all of which records are always accurately kept. As nearly as I can calculate, the bicuspid has advanced on the line of its long axis about eight-tenths millimetre, and has advanced to the surface but five-tenths millimetre. At this rate it would take probably four years for it to come to the surface. The extreme facial deformity caused by the superior retrusion requires prompt attention. Accordingly, the course being pursued is the extraction of the remaining deciduous molar and the adjustment of a very small jack between the first permanent molar and the cuspid, to force the latter forward to its proper position, and the anchoring of a very small device into the buccal cusp of the imprisoned bicuspid, and attached to the above jack, to extrude the locked bicuspid. This appliance is seen in position in Fig. 4.

Slide No. 5 represents a case of delayed bicuspids and cuspids at fourteen years. The permanent laterals have never formed.

Case L. (slide No. 1) is of a young lady seventeen years of age, with a serious depression of the superior arch and lip. The temporary cuspid is firmly in place, and has above it a deep fossa where the permanent cuspid would be expected to be. There is clinically every indication that the permanent cuspid has never formed. It lies palatally to the temporary cuspid, and its cusp is engaged against the lateral, which it has displaced somewhat. This condition has compelled the root to develop backward instead of the crown advancing.

Case VI. (slide No. 6) shows the contents of a tumor near the dome of the arch in the hard palate of a lady about twenty-five years of age. It had appeared only the last few years. The radiograph shows it to contain the missing permanent cuspid and second bicuspid. A series of several radiographs has shown these teeth to be located at about right angles to their proper position. As the arch is very much retracted, an effort will be made to put one or both of these teeth in their proper places in the arch.

In regard to the disturbing effects on his patient of the Röntgen rays, as very briefly reported to me by Dr. Allan, I must say that, while I know nothing of the condition of the tube or the length of exposure, I cannot believe they had anything to do with the symptoms reported. I have never seen or heard of any such effects. I would be glad to know more particulars.

Röntgen rays of weak penetration, such as would come from a low vacuum tube, would, if continued for, say, half an hour, or more, in close proximity to the body, possibly produce severe local disturbance in the form of a dermititis. Personally I have never seen a trace of general disturbance, and only a trace of local in just one case, as reported.

With kindest greetings to the members of The New York Institute of Stomatology,

Yours very fraternally,

WESTON A. PRICE.

CLEVELAND.

March 3, 1899.

DEAR DR. ALLAN:

I am very glad to send you a few negatives that I have made. Some are good, others indifferent.

Fig. 1 was taken to see if there was a permanent cuspid to come into the space where the temporary lateral had been lost a long time previous.

Fig. 2 was taken with a piece of bridge-work *in situ* to ascertain the strength of the root of the lateral, which is very slight compared with that of the cuspid.

Fig. 3. We wished to know if there was a permanent lateral. The negative shows that there is no lateral. The temporary cuspid and molars are in place, and the permanent cuspid and the two bicuspids can be clearly seen embedded in the jaw. The central is being thrown out of place somewhat, and it is caused by the permanent cuspid crowding against its root.

Fig. 4 was taken to find out the shape of the inferior wisdom-tooth, which is crowding against the second molar. The film was not put quite far enough back in the mouth to show the whole of it. The roots of the second bicuspid, first and second molars, with their canals and pulp-chambers, are beautifully distinct. I consider this a splendid negative.

I remain, very truly, yours,

DWIGHT M. CLAFF.

From Dr. E. S. Talbot, Chicago:

PERSISTENT TEMPORARY DEVELOPMENT.

BY EUGENE S. TALBOT, M.D., D.D.S., CHICAGO, ILL.

In dealing with the case of almost complete persistent temporary teeth at the age of fourteen, it must be remembered that there are several developmental factors to be considered. In the first place there is a tendency not marked but still observable for the periods of stress (which are indicated by dentitional phenomena) to appear later. In such cases the persistence of the temporary teeth would be an expression of advance. It has been observed that in such cases the temporary teeth remained nearly normal until removal was enforced by the appearance of the permanent teeth. In the case of a friend of mine every one of the temporary teeth remained until the thirteenth year, and would have remained longer had they not been removed. In other instances, molars have remained still later. This condition of belated periods of stress would be an expression of advance. It is possible, however, that the condition described may be an expression of the law of economy of growth, whereby an arrested development on one side resulted in an exaggerated development on the other. This condition may therefore be a reversion to the monophyodont (one set of teeth) of the lower vertebrata, whereby the diphyodont (two sets of teeth) is sacrificed to a more primitive type.

The monophyodont condition implies an extra allowance of teeth, as Kollmann and Gegenbauer have shown. Besides the rudiments of the enamel organs for the milk teeth and permanent teeth, there are additional organs present in a very variable condition and number, nearer the external surface. They are, however, very generally present, and are exceedingly similar to the youngest stages of

the normal enamel organs. Kollmann and Gegenbauer believe that they are abortive rudiments surviving from an ancestral condition in which teeth were more numerous. It is more probable that this may be the case, since there is evidence of hereditary defect. There is continually going on in the system a struggle for existence between different organs, and this struggle for existence, unless balanced by the nervous system, is apt to result in the gain of primitive structures at the expense of those later developed. These laws govern dental embryology as well as embryology in general. The question as to treatment would hence turn upon the fact whether this condition was an expression of advance like delayed periods of stress, or whether it was an expression of degeneracy under the law of economy of growth. In the latter case other stigmata of degeneracy would exist. It should be remembered also that proper development of the permanent teeth will turn upon, as Minot has pointed out, proper development of the dental shelf. This dental shelf is one of the latter development, so far as its relation for the provision for the permanent teeth is concerned. Interference from hereditary defect, or from causes operating during intra-uterine life, with the growth of the dental shelf would interfere with the growth of the permanent to the gain of the temporary teeth. The dental shelf (being of the transitory structure type), like all such, is more liable to atavistic tendencies than permanent structures.

DEAR DOCTOR ALLAN,—The case of reported retarded eruption I spoke about was briefly as follows: Miss H., a child of twelve years, began to show signs of mental weakness. In one year she became idiotic, lost the use of words, could not care for herself in any way or manner, refused to wear clothing unless it was fastened so she could not remove it, lost all regard for her companions; and the family, after consultation, had concluded to send her to an institution. She would not eat, and she would try to get to her mother's breast to nurse. Her mother, with a mother's love and solicitude for the child, came and asked me to see her and give an opinion whether the trouble could come from the teeth, and, if so, could it be relieved; for the mother reasoned that the child could not eat or take food, or it would not want to go to her breast. With Dr. Blume I called and saw the child. No permanent teeth were in the mouth except the sixth-year molars, and they were all broken down. The gums were terribly inflamed, and bled at slight-

est pressure. Two of the temporary teeth only were missing. I advised the immediate extraction of the teeth, for I knew nature could not tolerate such a condition of congestion and inflammation as existed in this child's mouth without some reflex trouble. I was given *carte blanche*, and extracted *every* tooth, upper and lower. In three years the child was able to attend school, and to-day is in full possession of all her normal mental powers, and has permanent teeth in their position in the mouth.

LEVI L. HOWELL.

EAST HAMPTON, N. Y., June 11, 1899.

The case is a very interesting one, but I frankly own that I am unable to give any information that would serve to enlighten any one. The reason for the non-eruption of isolated teeth is quite clear, and the literature of dentistry is full of cases, but why an entire set should fail to follow the general law of development is not so clear to my mind. Dr. Guilford's case of the edentulous man is, possibly a near approach to this, and, possibly, could the X-rays have been used in the case, the germs of the permanent series would have been discovered.

I can no more explain this than I can explain why the whale should have a full series of mammalian teeth in foetal life and balaen, or whalebone, subsequently, or why the so-called "botchie-nosed" whale should have a series of conical teeth in the front part of the jaw all completely hidden, besides rudimentary teeth.

We are yet in profound ignorance of the vital forces that control development, at least I am in the dark, and if Dr. Allan can divulge the reason in this particular case, I for one will be under lasting obligations to him.

Yours truly,

JAMES TRUMAN.

Mr. E. W. Caldwell.—The X-ray negatives which Dr. Allan has shown are made upon small pieces of sensitive film wrapped in such a way as to protect them from light and moisture and placed in the mouth of the subject, behind and as close as possible to the parts to be radiographed. The X-ray tube is placed from twelve to twenty inches from the patient's head and in such a position with reference to the film and the teeth to be examined that the shadow of the teeth on the film will suffer as little as possible from distortion. As

Dr. Allan has pointed out, it is not always easy to choose the best position of the tube for showing the parts correctly, and it is exceedingly difficult to make two pictures of the same part from exactly the same position. For this reason it is important to keep careful and accurate notes of the position of the tube with reference to the patient, so that if at a subsequent time another radiograph is needed, it can be made from the same position as the first one, and can therefore be safely compared with it.

I believe the best way of preparing the films for the mouth is to cover them with tissue-paper and place them between two layers of ordinary black dental rubber. The tissue-paper prevents the films from sticking to the rubber, and the black rubber, if carefully sealed around the edges, is sufficient to protect the films both from light and from the fluids of the mouth. In my first work of this kind (October, 1897) I used the ordinary cut films wrapped in black paper to exclude the light and sealed in envelopes of thin gutta-percha to protect it from the moisture of the mouth. The dental rubber makes a more flexible package than the gutta-percha and black paper, and it is much more convenient and easy to handle.

It is often desirable to expose more than one sensitive film at a time, and for this reason I prefer to use the thin "Kodak" films and place two or more in each envelope. The two or three films exposed at the same time may be developed separately, and by giving each one a different development it is often possible to bring out in each one some details that are lost in the others.

The X-ray tubes used for dental work should be of the highest possible efficiency. I prefer tubes of the large globular form, such as are made by the General Electric Company. The tubes I am using seem to give the best results when the vacuum is such that sparks will just pass between the leading-in wires when they are approached within about four inches of each other.

The duration of the exposure will depend upon the subject and the power of the tube. I have some good negatives with exposures of five seconds, but ordinarily I prefer to make an exposure of about half a minute with the tube fifteen to eighteen inches from the face.

With such exposures as this there is practically no danger of burning the patient, but when a great many radiographs are to be made within a few days it may be well to take the precaution to interpose between the tube and the patient a "grounded" metallic screen. This screen may be made of a piece of cardboard, about

fifteen by twenty inches, covered with metal foil (gold-leaf or any similar material). The metallic surface of the screen should be grounded or connected to a gas- or water-pipe by means of a thin wire. It is not known just how effective this screen is in preventing burns, but it is safe and easy to use and probably affords some protection.

The X-ray tubes may be excited either by the discharge of an induction coil, a static machine, or a "high frequency" coil. An induction coil capable of delivering thick, "fat" sparks about ten inches long is probably the best and most reliable apparatus for the purpose. With an induction coil it is necessary to have a good interrupter. The ordinary vibrating interrupter usually supplied with an induction coil is not a very satisfactory machine, especially if the current is taken from electric lighting mains at about one hundred and fifteen volts. I prefer to use a rotary interrupter going about eighty breaks per second. I have used also electrolytic and liquid interrupters (*New York Electrical Review*, May 3, 10, 17, 1899) with very good results, but the rotary interrupter I am using is less noisy than the liquid interrupters, and is cleaner and more easily controlled. The Wehnelt interrupter has the advantage of enabling an ordinary induction coil to be used for X-ray work with an alternating current supply.

In conclusion, I would suggest to those who contemplate fitting up an X-ray outfit to get the best apparatus to be had. At best it is laboratory apparatus, and the making of good radiographs requires the same patience and careful manipulation that are necessary in all difficult laboratory work.

The President.—Dr. Clapp, of Boston, will now exhibit some X-ray pictures of other cases. (Illustrations by means of screen pictures.)

Dr. Dwight M. Clapp.—Speaking of burns resulting from the X-ray, so far as I know the effect of burning will not be felt for about nine days after exposure. I have no means of knowing why. A gentleman exposed his little finger for about half an hour, at a distance of an inch from the tube, and he was most severely burned. It did not appear for about nine days, but it then began to show signs of trouble which was most persistent. It was a sore that did not yield to treatment. This was some three years ago, and his finger has not yet regained its natural skin and appearance. Burns seem to me to depend entirely upon the length of exposure and dis-

tance from the tube. I usually make three exposures of from one-quarter to one and one-quarter minutes. Good pictures can be obtained in about fifteen seconds. I have often made three exposures, and then in a few days made three more, and then again three more. I do not think it possible, at a distance of eight or ten inches, to burn with a fifteen-seconds exposure. It is necessary to be quite careful; although I have never had any trouble, others have. I have never seen any bad effects whatever. I should never hesitate to make the exposures.

Dr. J. Morgan Howe.—Before we adjourn I would like to move a vote of thanks to Dr. Learned for his interesting paper upon the subject of sleep, and to Dr. Clapp for his interesting and valuable exhibit and his explanation concerning radiographs.

Carried.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, Wednesday evening, May 2, 1900, at six o'clock, President Pond in the chair.

The minutes of the previous meeting were read and approved.

A paper was read by Dr. Levi C. Taylor, of Hartford, Conn.; subject, "Sanitary Condition of the Mouth and Teeth, with a Business Method of obtaining the Same."

(For Dr. Taylor's paper, see page 531.)

Also a paper by Dr. Charles A. Porter, of Boston; subject, "Actinomycosis about the Mouth."

(For Dr. Porter's paper, see page 522.)

DISCUSSION.

President Pond.—We are to have a paper to-night by Dr. Levi C. Taylor, subject, "Sanitary Condition of the Mouth and Teeth, with a Business Method of obtaining the Same."

Before presenting Dr. Taylor, who is to read this paper, I think I ought perhaps to give him away, or give away some of the

information which he has given me. He admits to-night that he is the sole person who influenced our esteemed fellow-member, Dr. Brackett, to study dentistry.

It gives me great pleasure to present Dr. Levi C. Taylor.

Dr. Taylor.—Mr. President and members of the Academy, I want to express to you my gratitude at being present to dine with such a body of men as this. I consider it a very great honor to be invited to come and speak to a society of this character upon a subject of this nature, a subject, probably, of more importance than any other that is brought before the dental profession to-day. There seems to be a great difference in the opinions of men as to our mode of attaining that sanitary condition, and as one of the leading thoughts, I wish to read a very short paper to you this evening.

Dr. Eames.—The hygienic condition of the mouth is a subject of great importance; it includes not only the polishing of all surfaces of the teeth, massaging the gums (and I suppose that may include instructions to the patient to do this as far as they are able), and the proper use of antiseptics, but also an inspection of the surrounding soft tissues by the dentist, an examination into the condition of the tonsils and the tongue, about which mucus will lodge and dry. A great many breathe through the mouth, and, of course, not receiving the moisture obtained when the breath enters through the nose, it dries there, forming septic masses in the crypts of the tonsils and other cavities. The effect of this upon the stomach, as well as in the mouth, is deleterious. This occurs by reason of swallowing and by means of the breath.

The means by which a hygienic condition of the mouth is accomplished should be interesting, and I wish that the essayist had gone more into detail as to the methods of sterilizing between the teeth. It seems to me the proper use of nitrate of silver between some of the molar teeth and surfaces which are not exposed to view is a very important aid to sterilizing and keeping them immune from decay. It does seem to me also that an antiseptic spray directed with considerable force from a compressed-air tank will drive out from beneath the margin of the gum, and between the teeth, any accumulations. The use of a brush or scraper over the tongue is something about which we ought to instruct our patients.

Dr. Brackett.—I am very glad to acknowledge the dental father-ship of the essayist to whom we have listened. We were school-

boys together among the hills of New Hampshire. He is somewhat older than myself, and his influence and success were very strong in leading me to try to learn dentistry. It was in Dr. Taylor's office that I began my dental studies, and the aid and instruction which I there received from him, and from Dr. Riggs also, who was occasionally about the office, have made an impression on me which will never be obliterated. I am always glad to testify my grateful appreciation for what I received from Dr. Taylor.

About the merits of this treatment which he advocates, I do feel very sincerely that the health of the mouth is a thing which should first occupy the dentist's attention in making an examination. I fear there have been in the past, probably more than in the present, practitioners who have construed a search for cavities to be the equivalent of an examination of the mouth. The two expressions should not be synonymous. The investigation of the general conditions of the mouth with reference to all that it presents of suggestion, for the patient's welfare, is one thing. The searching for cavities of decay and finding and caring for them is one element, one part of the whole subject. Some of us who are older have seen in past years a good many instances of people who have been from their childhood once or twice a year for examination and treatment, asking of the dentist only that he render his best service to keep the mouth constantly in good order, and in these mouths there never had been efficient cleansing. There either had been no attention whatever paid to accumulations upon the teeth, or if there had been attention paid, it was to those accumulations which were upon the visible surfaces, and they had been partially removed for the sake of better appearance.

I believe all of our young men who have gone out from our good dental schools in the last quarter of a century have gone out with an appreciation of the desirability of thorough cleansing and the efficient removal of accumulations, wherever they are or however far beneath the margin of the gum, or in whatever out-of-the-way and invisible position, as well as in the prominent and visible places. I think among the patients of the gentlemen who are seated about this board it is the regular thing for a reasonable degree of general health and a reasonable degree of cleanliness to be found; but I feel there is force in that which Dr. Taylor urges, and I believe it is based upon good principles.

One of the latest presentations of what appears to be truth in

the etiology of dental caries was made by Dr. J. Leon Williams a few months ago before the New York Odontological Society, and subsequently published in the *Dental Cosmos*. Dr. Williams's paper gave prominence to the idea that the harm of bacterial action comes immediately upon those surfaces of enamel to which the bacteria tenaciously attach themselves and remain. That is, that instead of general conditions of acidity as they exist in the mouth as a consequence of the existence of micro-organisms in the mouth, being the immediate cause of the disintegration of the lime salts of the enamel, it was rather apart from that general acidity. The erosion and disintegration of enamel here were consequent upon direct action produced by firmly and tenaciously adhering patches of micro-organisms. Now, if this is the truth on these points, the practice which our friend has presented appears to meet the indications, at least so far as the mechanics are concerned. Such scouring at short intervals of all enamel surfaces, labial, lingual, and approximal, as shall remove adherent masses of micro-organisms, when supplemented by constant efficient care on the part of the patient, should go far towards the prevention of caries.

Dr. Taylor has told me privately of some cases of his, one case in particular, that of a middle-aged lady, who had usually required each year quite a number of fillings in cavities that were very sensitive. That lady's mouth is one of those to which he has applied this practice, with the result that in a year no cavities have developed, and there has been a subsidence of irritated and sensitive conditions such as had never before been attained.

Dr. Fillebrown—I would like to express my appreciation of Dr. Taylor's effort here to-night. I remember very well receiving a very lasting impression in his office, it must have been twenty-five years ago. I called there one day to meet Dr. Riggs, and the doctor sat me down in his chair and worked over me for about three hours, and made a lasting impression. The impression made me unable to chew with any degree of comfort for a week. But it impressed upon me the importance and efficiency of his treatment.

A great deal is due to Dr. Riggs for developing a scientific practice for Riggs's disease. Dr. Riggs's ideas you will find recorded in Harris's "*Principles and Practice of Surgery*" years before that. I remember perfectly well doing the same thing myself and of seeing cases that my father treated years before I heard of Dr. Riggs; and still neither my father nor myself had the far-

sightedness to formulate it and bring it to the attention of the profession in the form that Dr. Riggs did. I am exceedingly sorry that Dr. Riggs had not a little more of the literary turn, and that he should not have put his ideas in the form of a paper and had it go on record, so that there should be no mistake and no question as to his claims to originality in the matter of developing the treatment.

I long have had patients who have done themselves as well as myself the favor to come in for every month at least, or oftener if any trouble occurs. What I say to my patients is, "If these foreign substances are not kept off the teeth the teeth surely will go to ruin, and whenever you see the gum thickening a little, or growing a little red, you may know there is trouble and you need to have treatment." Certainly teeth ought to be attended to once a month. I have in mind one patient who calls every two, four, or eight weeks, and has done so this eight or ten years. When this patient first came to me the teeth were loose and very near destruction. To-day they are firm and healthy.

I remember as long as twenty years ago or more a patient came to me with teeth standing so they looked like a Virginia fence, leaning out and in, and by the judicious use of scalers and by polishing the teeth they gradually came back into place and presented a very creditable appearance indeed.

The plan that has been described here by Dr. Taylor to-night is unquestionably the right thing. If teeth can be kept absolutely clean there is no doubt but that caries can be prevented. I am glad he is so fortunate as to have so many of his patients follow him. I wish the whole community could be of that kind, but the fact of it is, they are not and cannot be. It is very desirable that a plan so perfect and well developed should appear, that those who are willing to be saved may be.

Dr. Bradley.—There is one suggestion that Dr. Taylor gave us, about the younger dentists feeling an ambition to work in gold and acting as though the cleansing of teeth and keeping the mouth in a hygienic condition was beneath their ambition, which I wish to say a few words about.

I remember some years ago seeing a young man, a graduate of a dental school, who presented himself to take a further post-graduate course, and there was given to him a patient, what he termed "a mere cleaning case," and he said to me, "I have taken one de-

gree, and I know how to clean teeth. What I want to do is to fill teeth." He wanted to spend his time in filling teeth, and so on. But after some conversation, in which I in a pleasant way showed him the importance of it, he came to the conclusion that there was something to be done in cleaning teeth and getting the mouth into a satisfactory condition. Before the young man left Boston he acknowledged to some of us that he had found the necessity of doing this work in a thorough manner, not simply for the personal appearance, but that the teeth might be really clean.

There is so much cleaning done just to have the teeth look well on the surface, and not to make them clean and healthy, that I think the importance of it cannot be over-estimated in getting at the difficult places. I question whether many of us will get to see our patients once a month, but I am very sure that the more perfectly we can get our patients to keep their teeth, with our assistance, the less decay we shall have, and it is the field in which we must work, the prevention of decay, not the restoration of the part after the damage is done, but trying to prevent it as much as possible; and so to that extent I am in hearty sympathy with the sentiments of the essayist this evening.

Dr. Williams.—Dr. Taylor refers to massage as one part of the treatment he recommends. I would like to ask what was the operation of the massage in his treatment?

Dr. Taylor.—This gentleman asks the question, what I mean by massaging. To massage is to rub, as I understand it, and stimulate by friction a healthy action in any part of the body. I was talking with a physician in New York City a few days ago about this matter of massaging teeth. He said, "You may massage any part of the body, and that part that you do massage will improve materially in advance of all the other parts, and I do not know why the teeth are not susceptible to the same results."

The gentleman at the other end of the table thinks it would have been interesting if I had gone a little more into detail. But coming before a body of men of this character, it is a very difficult matter to put in black and white all the little details; it almost looks as though we were questioning their ability, and for that reason I touched as lightly as I thought advisable.

The matter of system, making yearly contracts with the patients, is simply to have them pay for something, and then they feel that they must come,—not to make a contract in the sense of the

word that is so objectionable in medicine, but when a patient pays for a thing he is pretty sure to come and get it. It is the only way that you can compel them to come each month regularly, systematically, and on time; and when you do that you will get them.

I want to see those patients often enough to massage the teeth with the orange-wood stick and pumice and do all my work with that after the mouth is under complete subjection. I will say this, that it will take, in ordinary mouths, from four to eight months to get the mouth under subjection. Now, that may seem a little strange to you. If you will take a case and do the very best you can, cleaning every part thoroughly, spending hours, and then follow it month by month for six months, and note the improvement that you will get, you will be elated; it will please you. It is something that has surprised me. I had no idea that the constant systematic work would produce the advanced condition of pleasure that it produces to see how the mouth improves.

These cases that I referred to in my paper as being two of the worst were not cases of Riggs's disease proper, nor of pyorrhœa; they were cases where the coating would come around the neck, and the teeth were diseased with what we call the white chalky decay. You have seen that many times around the necks of the bicuspid, very rapid decay, very sensitive, very painful to the touch. Gentlemen, if you will polish and, as I call it, "massage" (call it what you please) often enough, you will be able to nearly or quite prevent decay. In extreme cases of this kind you had better take them every two weeks for a few months. I want to say right here that I have now a patient that has been under my care for five months, the worst case of sensitiveness on the cuspids that I ever saw. She is a poor girl. I have had interest enough in the case to say to her, "If you will come every two weeks I will do my best for you free of charge; I want to know what I can do." I will say this, that I saw her for four months before I could even touch the teeth with the stick and pumice without her just getting wild. I am getting now so that it is coming into shape and I can begin to rub them very considerably. It is painful yet, but I predict that in about two or three months more I will succeed in reducing the pain. I have tried tannic acid and an innumerable number of remedies, and not one of them seemed to have any effect. I have followed this four months, and now am just beginning to see some results. Am not yet through with the case.

Dr. Fillebrown refers to my having fifteen patients. Gentlemen, there is not a man in this room who cannot have within three years' time three times fifteen patients who will stand by him straight and square if he handles his patients rightly. These patients are the most appreciative that I have ever had. The results are wonderful.

As regards what he says about Dr. Riggs's treatment, his case I remember very well, some twenty-five years ago; it was an advanced case of pyorrhea, trouble on the lower teeth; his upper teeth were not so much affected, if I remember rightly. He treated the under teeth. I am not speaking of treating the advanced cases. I want you to take this method up in your common, everyday practice, and study each case well.

It is not an uncommon thing to see mouths that have been cleaned as I had one a short time ago. A man came in and said to me, "Doctor, I have come to you because I want better work than I have been getting." I told him his teeth needed cleaning. "Why, I had them cleaned only a week or two ago," he said. "My dear sir, you haven't had your teeth cleaned in ten years." "Well," he said, "if I haven't, I want them cleaned." It was not a case of pyorrhea at all; it was a simple case of cleaning teeth. It took me one hour and twenty minutes to finish up, after the other man had spent five or ten minutes with his engine. There was no pyorrhea.

I want to speak of one particular case that I have followed for twenty-five years. A lady had a front under tooth where the gum had receded the full length of the tooth almost to the apex. The apex was not exposed. She commenced with Dr. Riggs twenty-five years ago, at the time our friend was there. He treated it as long as he lived. Afterwards it came into my hands. I have followed that case once in two or three months ever since, and I am not able to see that there is one bit of progress in the disease working down. Almost every time that she presents herself there is quite an amount of the white soft tartar, but this can be almost entirely removed with the stick and pumice without an instrument. But what I want is to get at this often enough so the stick and pumice will do the whole business, and do it well. But it never will be done thoroughly with the engine because it is so deceitful. You will do what is visible to the eye, but you do not get up under the gum. A man says to me, "We could retouch it after-

wards." Yes, but you do not do it. You have cleaned off the face of the tooth; you have cleaned it beautifully, and what will be the result? You won't take your stick and work up under the gum, because you haven't your guide to go by. If you do what is under the gum first with your stick and pumice, and do it well, when you are through there will be nothing left to be done with the engine.

I am well aware that in spending the time that I believe in spending it is necessary that we get a higher fee than most men are inclined to charge for such work; and that is one of the beauties of the yearly contract system, where you guarantee a mouth against decay. It is not guaranteeing against breakage,—it is not guaranteeing against a pulp that may die under a large filling that has been in the mouth fifteen to thirty years,—but it is against actual decay. It works both ways. The knife is a double-edged one. If you do not do your work well you will have teeth to fill.

As regards the fees, that is a very difficult question, and I cannot draw any line for all classes of men, because the high-priced man of the city cannot afford to work for the price of the cheaper country practitioner, and it would not be right that he should be asked to. But the basis upon which to work would be to ascertain so far as you can what you would obtain from that patient under the ordinary methods of treatment annually, not taking it some year when they have neglected it for three or four years, but what you average to receive. Make this a basis, then add twenty-five to thirty per cent., and you will not be far out of the way in making your yearly contract. You can very easily make your own estimates after you stop to think and figure along this line. This is a question that can be regulated by all of us.

I want every one to feel that they must do their work faithfully. Many first-class practitioners, so considered by the masses and by the profession, are not doing this particular work well. They are doing beautiful filling, but it would be far better for them and far better for their patients to prevent the necessity for filling. It can be done.

Subject passed.

President Pond.—You all remember a short time ago we had a very interesting meeting, made so quite largely by the efforts of Dr. Porter. Dr. Porter has kindly consented to come again and give us another paper, and I have no doubt will add another very interesting meeting to close our series for this winter.

I have now the pleasure of presenting Dr. C. A. Porter, who will give us a paper on actinomycosis about the mouth and a report of ten cases.

DISCUSSION.

Dr. Briggs.—This is a very interesting paper to us, perhaps more so than we realize. As I look back a number of years I remember cases that it seems to me may have been due to actinomycosis.

I recall one case in particular that was suggested to me by Dr. Porter's treatment, from the fact that after working on this case a good deal I finally put the patient on iodide of potash, and he made better progress than he had under my surgery.

Last winter Dr. Hardy called me in consultation for a young school-girl; an examination showed a large abscess at the side of the jaw, about opposite the second molar. It was almost ready to break through the skin, and the anxiety was to prevent its breaking through and making a scar on the young woman's face. The second molar had a history of having an abscess on it, for which it had been treated. And through that tooth I tried to reach the fistula and the abscess. We only found one canal, and the case not yielding at all, and the patient being in a very low state, weak and sick, the tooth was finally extracted in order to get at the abscess better. The tooth proved to be a single-rooted tooth.

The abscess was opened, but did not yield to treatment, and the danger grew more imminent that it would break through the face. Dr. Munroe was called in consultation, and at his suggestion a specimen was sent for microscopic examination, which proved it to be a case of actinomycosis, with the subsequent treatment and cure as described by Dr. Porter. This is a case in practice which shows that it does occur, and I have no doubt that many other cases that I can recall were such.

Dr. Fillebrown.—I want personally to thank Dr. Porter for bringing these cases before us here. They are extremely instructive, and while I haven't anything to say to-night other than this, I hope to make further use of it in the future.

Dr. Porter.—I did not intend to have you understand that I really think that this disease is a common one. When any one has a hobby, they interpret things in the light of that hobby, as I said before, and I began to think that actinomycosis must be a common thing. I do not doubt that carious teeth and roots are the cause

of the great majority of alveolar abscesses; but I think it is interesting to have in mind the fact that a diagnosis can be made, and actinomycosis can be ruled out by a microscopic examination. Undoubtedly in certain cases it would be found that they were due to actinomycosis, and the surgeon would manage that case differently from what he would an ordinary abscess. I really think that thorough removal would give the patient less scars than if the disease progressed. Resort first to thorough curetting, and then if the disease returns, tell the patient that an incision would give him less trouble than simply curetting three, four, or five times.

Dr. Bradley.—I am sure that we all appreciate the opportunity of listening to two such papers as we have this evening, and I shall only voice the expression of the fellows of the Academy in moving that the appreciation be shown by a vote of thanks both to Dr. Taylor, of Harvard, and to Dr. Porter, who has come in to give us the result of his work. I move that we pass them a vote of thanks for our appreciation.

CHARLES H. TAFT,

Editor American Academy of Dental Science.

ACADEMY OF STOMATOLOGY.

At the regular meeting of the Academy of Stomatology, held March 27, 1900, the President introduced the essayist for the evening, Dr. B. Holly Smith, of Baltimore, Md., who read his paper entitled "Fetor from a Dental Stand-Point."

(For Dr. Smith's paper, see page 514.)

The President.—Gentlemen, I am sure that you will agree that we have all listened to an extremely interesting and able paper on a very important subject. It is a subject to which, perhaps, we do not give the attention that we should as a profession. I hope that we shall have a general discussion of this matter. I am sure you are all interested in it, and all must have had some experience which will be of benefit to us here.

Dr. Brubaker.—It seems to me that all the statements that have been made have been based on well-established physiological and pathological facts.

Independent of the local condition of the mouth which has been alluded to, there can be no doubt that much of the disagreeable fetor of the breath is dependent upon the putrefaction of proteid material which occurs in the small intestine. Owing probably to some indiscretions in diet, there is gradually established in the small intestine, more particularly in the neighborhood of the biliary passages, a catarrhal condition which interferes with the proper elimination of bile and probably of pancreatic juices, and, in consequence of this, the proteids undergo various stages of putrefaction, with the development of compounds which are extremely fetid, such as skatol, indol, etc. Some of these compounds, after being absorbed from the intestine, are eliminated under various forms, but there is not much doubt that some of these putrefactive products are absorbed into the blood and eliminated by the pulmonary mucous membrane, and, in this way give a very decided odor to the breath. These decompositions which take place in the small intestines are very readily recognizable by well-known clinical tests, and can, to a very great extent, be obviated by treatment of this part of the intestinal canal.

In this connection I think it may not be out of place to make a suggestion with reference to the treatment. The treatment of the intestine is very simple, and consists essentially in the removal of this catarrhal state, which is accomplished to a very great extent by the use of pulverized sodium phosphate, given in half-teaspoonful doses with plenty of water daily, especially in the morning. It has an admirable effect, stimulating the intestinal tract and biliary passages. A pill administered at night as required, and consisting of one grain of blue mass, one grain of aloe, and one-quarter of a grain of podophyllin, is one of the best combinations for the removal of those putrefactive changes in the small intestines upon which fetor of the breath very frequently depends. The drinking of an additional quantity of water assists elimination of these odorous emanations. I think that every dentist is privileged to prescribe remedies as simple as those I have mentioned, and I am quite sure that if they are applied this condition of the breath will be largely removed.

Dr. Schamberg.—I applaud the sentiments that have already been expressed in this valuable paper. There are one or two points that come to my mind to which I would like to call the attention of the society,—namely, the excessive fetor that is produced by the

use of tannic acid in the mouth for the checking of hemorrhage. Only recently I had occasion to assist Professor Cryer, at the University, in an operation upon a necrosed maxillary bone, in which there was a considerable amount of hemorrhage and tannic acid was used as the hæmostatic. In this instance we noted a most horrible fetor. It was simply unbearable upon changing the dressing, and was sufficient to make the patient feel temporarily sick. I was quite sure she had been inhaling these obnoxious odors up to the time of the changing of the dressing. I must say that in other particulars the paper is highly important. I myself experience after eating a meal a most horrible odor if I nap after that meal, and many thoughts have suggested themselves to me as to the cure of such a condition. One is the use of some form of lozenge which one may take as a confection and in which would be incorporated certain drugs which have antiseptic properties that would act to overcome the fetor of the breath, and, at the same time, neutralize the acidity of the mouth. Of course, this at first seems rather contrary to ideas of the dental profession regarding the effect of confections upon the teeth. At the same time, I imagine, that such a lozenge could be made palatable and even inviting to even young children, and I imagine that much dental caries could be checked in that way.

Dr. A. H. Thompson.—I have been very much interested in the paper and have benefited by it, as we all have been, and I should like Dr. Smith to have gone very much more into detail with regard to such antiseptic care of the mouth as would be desirable for us to advise our patients to associate with ordinary hygiene.

We know that accumulations about the teeth give rise to offensive odors, even with persons in the best of health, and that constant care is required to remove particles that may decompose. I think we do not yet have the proper method of what we might call the sanitation of the mouth, nor that we prescribe for our patients what is really ideal hygienic care. Of course, we have some antiseptic washes that can be used, but something more is needed.

Dr. Pierce.—I want to thank Dr. Smith for the paper, and say that I believe with Dr. Thompson that we have quite a field for the introduction of good antiseptic washes. I have been impressed for some time with the advantage that may be obtained by their proper use, and hope for the production of some wash or washes that may be advantageous in fetor due to local conditions.

Dr. Gaskell.—I was very much interested in the paper, and think attention should be especially directed to the offensiveness of badly constructed bridges and crowns, particularly the so-called "saddle-bridge." Food and foreign substances will crowd beneath it. If we had a perfectly hard surface to deal with it might be different, but the mucous membrane yields and the saddle does not fit. In one case a saddle-bridge had been in the mouth for one year. The patient had paid six hundred dollars for it. The saddle was carried back from the cuspid for a distance the width of three teeth on one side, and there was a strip of gold crossing the palate, with a piece of bridge-work on the other. This made a shelf for the deposit of food. When that piece of work was shown to the patient she said, "You could not pay me a thousand dollars to have that put back into my mouth." That was done by a man of wide reputation, and I think he should have known better.

Dr. Jameson.—I have enjoyed Dr. Smith's paper very much, and believe he has done good service in calling our attention to these conditions, which should meet with more thorough and general recognition and systematic treatment at our hands.

I have noticed a number of times the fetor arising from diseases of the antrum. When the antral troubles are removed, of course the fetor disappears.

Dr. William Trueman.—I have listened with a great deal of attention to the essayist, and was particularly impressed by the suggestions which he made and the way in which he broadens the field of dental science. It is not sufficient that we understand the parts upon which we work, but we have opportunities constantly offered us to be of very great assistance not only to the patient, but to the patient's physician. The doctor has related cases that had been under the care of specialists who had utterly failed to discover the causes of the trouble. The common idea is to mask fetor of the breath, and you all recognize that as dangerous. The next idea is to combat it by some agent that shall neutralize the agent that is producing the bad odor. The doctor suggests this not to be the proper way, but to find and remove the cause, restore the parts to a healthy condition, and then the odor at once ceases.

Dr. Cupid.—This is such a practical question that it interests us all. If we do not understand particularly the cause of the trouble we certainly cannot work out its removal or overcome the condi-

tion. I think, as has been said by the essayist and other writers previously, that there should be attempted the mechanical removal of this deleterious substance—no doubt waste material—which has been retained in the tissues, particularly in the furred tongue. The dead epithelial layers which should be constantly thrown off are being retained, chemical decomposition is going on, leading up to a profound putrefaction, which necessarily produces intense and persistent odors, and if we can remove them mechanically it is a great step towards overcoming the trouble. If we can go back and remove the cause of the trouble it is still better.

I wish to speak of two different systems that I have followed very carefully and partly successfully. These are the medicinal treatment with permanganate of potassium and the mechanical with the tooth-brush. I have found that thorough scraping of the furred tongue and the mucous surfaces has resulted in great improvement, not only in the case of my patients, but with myself, by the removal of collections of dead epithelial tissue and substances that have been retained about the fauces. In every case where I find fetor I invariably prescribe it, together with the use of permanganate of potassium in dilute solution.

Dr. Gaylord.—I feel very grateful to the essayist for the paper this evening. It has been very helpful to me and has broadened my ideas.

It seems to me that one point has been overlooked in the matter of fetor, and that is the accumulation of calculus about the teeth. It is one of the most important things that come under the eye of the dentist, and which, I fancy, is more or less neglected by the profession, partly owing to its disagreeable nature; but we cannot conscientiously dismiss a patient without thoroughly removing this substance. So long as it remains we cannot expect a clean, wholesome mouth.

Dr. Rice.—The subject of the removal of particles of food that have been retained in the interdental spaces has been dwelt upon, and I am surprised to find that the atomizer has not been spoken of. The mechanical removal of these particles of food is necessary for a lessening of this fetor. I have found that the use of the atomizer is very efficacious, and that the proper projection of the antiseptic upon the tissue is more important than the antiseptic.

Dr. Kirk.—I should like to call attention to the point that a fetor of the breath is not always indicative of a pathological con-

dition. In all those conditions where the salivary secretion is suppressed, either temporarily or for a length of time, there is developed, as the essayist has indicated, a tendency to putrefactive changes in the mouth, and this tendency may be developed in a perfectly healthy individual during the night. I think that all who have had the experience of raising children have noticed that even in the mouth of a perfectly healthy infant, where there is no evidence of any caries or other pathological condition, if there is a tendency to mouth-breathing at night, as there may be for a short time, it is quite a common thing for a slight heaviness or disagreeably fetid breath to be developed. It will almost immediately pass away as soon as the salivary secretion is re-established. The reason for this would seem to be that the germs of putrefaction do not develop so readily in a mouth in which the saliva is rapidly or normally flowing.

There is another condition which has not been fully dwelt upon, and that is the relation of food-habit to *fetor of the breath*. It is undoubtedly true, as alluded to by Dr. Brubaker, that the digestion of large quantities of proteid food is more apt to produce this odor of the breath than where a vegetable diet is used. I think that may be accounted for by the fact that the activity of the salivary glands is perhaps more stimulated by a vegetable diet than a proteid one, with consequent inhibitory action upon the germs of putrefaction by saliva in quantity.

Dr. B. Holly Smith.—I think it has been well said that the importance of oral sanitation, and the means of carrying it out, is a thing that should be dwelt upon. I recall with some chagrin and mortification a patient who came to me some years ago with a mouth in almost perfect condition. The mucous membrane was everywhere of a beautiful, healthy tint. The teeth were white and clean, but at the angles the gum had been brushed away from the cuspids and bicuspidals to some extent by what I supposed was a very stiff brush. I counselled the young woman to avoid the use of this stiff brush. She told me then that she used the brush quite a good deal on the soft parts, and her teeth were beautiful and her mouth was in a nice condition. I have never had the courage to say to that young woman what I must say to her when I have a settlement with my conscience, that I did her a great injury by warning her to be careful in the use of her brush. I suggested a softer brush, and now she comes to see me twice a year,

and I have calculus to remove and her mouth is not in as healthy a condition as before. There is every evidence of neglect on her part, and I feel that I am a party to it. I now frequently instruct my patients to clean out about the palate and the little circumvallate papillæ, which often grow up like mushroom's. In the case I spoke of, where they were obliterated by the electric cautery, the woman was a charming lady, who occupied a good social position, and after I began to see something of her family and friends they talked about "the great misfortune." Really, it seemed so desperate that the young lady had such a bad breath that they did not like to talk to her about it, and it was a source of mortification and embarrassment to all. I had never read anything along this particular line, and I do not know that Dr. Thomas, who assisted me in the operation, had either, but we decided that these little valleys about the fungiform papillæ seemed to fill and retain enough fetid matter to impregnate every breath. Since then I have never had occasion to use the cautery, but I have called the attention of my patients to the use of the broad brush for cleaning the tongue. I have no doubt that the vigorous, though careful, cleaning of the tongue and mucous membrane will aid in the production of a healthy condition.

I am sure that it is more than gratifying for me to hear so many kind words of commendation from the members of this society, and it has been a very great pleasure for me to be with you.

OTTO E. INGLIS,

Editor Academy of Stomatology.

Editorial.

WHAT WILL THE HARVEST BE?

THE traveller along the dusty highways at this period of the year can enjoy the landscape with its variety of color, and the undulations of grain-covered fields with the heavily laden heads, indicating a hopeful outlook for a bountiful harvest. The statistician and the gambler in the wheat-pit each can closely figure upon the world's great annual harvest, and each in his way can tell

us how many billions of bushels of wheat will be added to the world's granaries for the coming year.

At this period, also, another harvest has been ingathered. It is not in wheat or corn, but in graduated men and women, the harvest of intelligence that is sent forth yearly to enlighten the world and to feed other minds, and thus the cycle of a world's life moves on, the physical and mental correlating each to the other and adding to the sum total of human knowledge and experience.

The record is made up for the year in all dental colleges. Hundreds of young men and women have passed the crucial tests of college and State Board examinations, and are now scattered far and wide seeking a resting-place somewhere to work out the problem of life.

When the thought centres upon this great addition to the army of dental workers, the query naturally arises, What will the harvest be? In other words, will this large addition work to the good or ill of the dental profession in this country? In a former article there was an effort made to prove that the number of graduates, great as it is yearly, was not in excess of the growth of population or increase in intelligence among the laity in regard to teeth. This view is still held, and while some are discouraged when they read the long lists of graduates, there is apparently no reason for this pessimistic view. When the interests of the individual are considered, there may be cause for anxiety.

The college man, the teacher, regards this annual harvest with some feelings of mental disturbance. He cannot look at it from the point of view of the practitioner or statistician, but combining these feelings he adds, in his view, the most important query, Has the harvest been productive of increased perfection? Has the work of the year developed a higher class of dentists? Will those who have graduated in the colleges the present spring and summer mean for the dental profession a higher standard of practical excellence? The mental examination he gives himself is not encouraging, and he is forced into the conviction that this higher standard has not been attained, and cannot be under present methods.

The fault, if it exists, does not lie with the teaching, or, perhaps, with the plans adopted, but with the time allotted the undergraduate. In the years past and, happily, gone two years were considered quite sufficient to make a doctor of medicine or a doctor of dentistry. Gradually this has been changed until four years

is regarded as the least possible time for the former and three years for the latter. The rapid growth in all branches of medical study, and this necessarily includes dentistry, will make it impossible to limit the time of study to the periods named. Medicine must go to five years, and eventually dentistry must follow.

To those who have been educated under old methods and have been measurably successful in practice, such continual lengthening of the terms may seem not only foolish but suicidal. These, however, while undoubtedly sincere in their convictions, lack the experience necessary to form correct opinions. The additions made to the curricula of all the colleges, especially dental, give a too limited period to accomplish the work desired. This has been heretofore fully considered on these pages, but its importance does not seem to have been impressed on dental educators to any perceptible degree.

The reason for this does not lie in the necessity for an increase in time, for this is certainly clear to all, but to a feeling that the schools are not financially equal to bearing the additional burden. In other words, a four-year course will mean the ultimate extinction of many of the dental schools of this country and the crippling of all. While this may be in part true, this selfish side of the question should not have weight. Many of our dental schools are not up to the highest standard, indeed, are essentially inferior in all that goes to make up a dental college. Their departure from the stage of activity would not be a serious blow to the world's progress, yet the loss of all honest effort in this direction is to be deplored. The temporary crippling of the higher schools means to them eventually a broader foundation and a higher intellectual and practical life.

While this is being written the delegates from distant localities are on their way to Old Point Comfort to meet with the organization known as the National Association of Dental Faculties. When this article appears it will then be known to our readers whether this Association was prepared to reach the high level outlined here, a full four years' course, or that the members decided foolishly to continue the shorter term, thus simply deferring for a brief space the inevitable. Whether this be the result or not, there is no cause for discouragement. The trend of civilization is forever onward, notwithstanding there are times, like the present, with its wars and its barbarisms, when it seems tending to a lower level. So

with college work,—a step in advance, a step backward; but as the years roll on there is a steady advance to the goal,—the ideal of the true educator.

The harvest may not be all that could be desired at the present period of educational work, but the indications all point to a future when all antagonizing forces will be brought into harmonious relations and an educational equilibrium be established.

THE CONVENTIONS AT OLD POINT COMFORT.

THE National Dental Association convened at the above place on Tuesday, July 10, 1900. The attendance was larger than anticipated, and quite filled the large meeting-room in the Hotel Chamberlin. This room was a great improvement over that of the preceding year at Niagara Falls.

The country, even as far as the Pacific Coast, was well represented, several delegates from the latter section being drawn there in attendance upon the National Association of Dental Faculties, thus demonstrating the value of holding the meetings about the same time and place, insuring co-operation in interest and work.

The National Association was called to order at the appointed time, by the President, Dr. B. Holly Smith, of Baltimore.

The good results of having an "Executive Council" to consider routine business was fully demonstrated, and the Association was able to begin at once with the real work of the body, reading of papers and discussions.

The President's address was an able presentation of many subjects connected with dental education and the management of the Association, especially in the necessity for a reorganization of the sections. In the final report of the committee appointed to consider this address it was recommended that a special committee take this portion into consideration and, if possible, devise a plan whereby greater vitality could be infused into these branches of the organization. This committee subsequently reported, creating a sub-committee from each section, termed a "commission," whose duty it would be to have conducted original investigations, keep in full critical touch with the dental literature of the year, and report upon the work to the section, and was given power to draw upon the general treasury to pay the expense of original work. The sections

reorganized under this plan, and it is hoped that the result will be to encourage investigation and, at the same time, eliminate amateurish productions and a constant repetition of ideas previously worked out.

The evening session of Tuesday was mainly occupied in the consideration of a paper by Dr. C. N. Johnson, of Chicago, on "Inlays: Their Advantages and Limitations." The general trend of the paper was a surprise to many, as it was a complete reversal of the opinions expressed at the meeting last year. The essayist was opposed to the indiscriminate use of inlays for various reasons,—difficulty in making them permanent, variation in color, etc. The support which this paper received from those who formerly strongly advocated the use of inlays indicates that the general thought is now tending towards limiting their use. While the methods of preparation may be defective, it is to be hoped that these difficulties may eventually be overcome, for they certainly have a value from an æsthetic point of view not equalled by any other of the recognized operations.

Dr. Ames advocated gold inlays, and this received commendation by some for large cavities in posterior teeth.

The principal papers in subsequent sessions were "A New Cavity Preparation for Distal Cavities," by Dr. E. R. Wedelstaedt, of St. Paul; "Art in Prosthetic Dentistry," by Dr. Mary E. Gallup, Boston; "A System of Removable Bridge-Work," by Dr. W. E. Griswold, Denver; "Antiseptic Surgery of the Face and Mouth," by Dr. W. H. G. Logan, Chicago; "The Evolution of the Bunodont from the Haplodont Forms of Teeth," by Dr. A. H. Thompson, Topeka, Kan. Several additional papers were read of more or less value on ethics and general dental education, but it must be acknowledged that, with two or three exceptions, there was a marked falling off in scientific interest from the papers of the previous year. This was not disappointing, as it was anticipated this would be the result of the excess of effort in this direction at Niagara Falls. It is expected that the reorganization of the sections, on the plan mentioned, will do away with this unstable character in the work of the Association.

While the meetings were pleasant and the discussions generally intelligently confined to the subject-matter of the papers, it must be stated that the proceedings lacked interest, and that those who came expecting to return laden with ideas doubtless left disap-

pointed. Such meetings, however, in the opinion of the writer, are never a failure. If they subserve no other purpose, they at least infuse new motive force into professional life, and those who attend must go away feeling its revivifying influence.

The meeting elected Dr. G. V. Black, Chicago, President for the ensuing year, and selected Milwaukee as the place of meeting, the first Tuesday in August, 1901.

The Association of Dental Faculties met July 13, 1900, at the Hygeia Hotel, Old Point Comfort. The work of this body was conducted with more harmony than at previous meetings. The elimination of the vexatious problems connected with State and national examining boards had largely to do with this, the business being mainly confined to educational subjects and the admission and control of colleges.

There was only one unpleasant feature connected with its deliberations, and that was the introduction of a lawyer to defend a college charged with not living up to the standard of this Association. This was exceedingly annoying, and really placed the college in a very unfavorable light before the other members. This should never be tolerated again, and a college so offending should be placed outside the pale of professional recognition.

The Association was not prepared to make any advance either in time or the curricula of colleges, and therefore the situation continues practically the same as it was previous to this meeting. It remains now for the larger schools to take the initiative and declare for a four years' course of nine months each, and this we feel assured will be done, not alone for the good of the student, but to enable faculties to complete the work of training undergraduates with the least possible friction and with the best results.

The National Association of Dental Examiners met at the same time and place, but the writer is not aware of any special legislation affecting colleges. The harmony between the two Associations was not disturbed in any way. The nearest approach to this was an introduction of a resolution in the Faculties to do away with the endorsement of State boards on certificates of application for membership in this Association. This has always been required, and has been a constant source of trouble. When it was adopted by the National Association of Dental Faculties, it was essential to a proper understanding of the position occupied by the colleges in the State, but now, with the facilities for the personal examination

required, the method is antiquated and a constant source of friction. The Association was nearly equally divided on the question, but the rule still remains among the laws for the ensuing year, and it is hoped for a not much longer period. Why some men seem eager to do the work of the State boards appointed by the governors is a problem, but that many constantly truckle to these bodies is an assured but a melancholy fact. The National Association of Dental Faculties can have nothing to do legitimately with any such organizations, however worthily they may be constituted. The peace of the present is simply a truce. This may not be broken, but there are latent forces at work which sooner or later will cause violent disturbance. It is useless to expect any other result; in fact, such a peace is not desirable so long as these boards are composed, as they generally are, of political favorites and with little or no regard to the ability of the men composing them. Ordinarily they are unequal to traversing intelligently the work of the colleges. The exceptions to this are so few that they need not be considered.

This year, so far as dental conventions are concerned, may be regarded as a weak year. This must be expected to follow in regular course. It is anticipated that 1901 will show a marked improvement. There is certainly room for it, and the censorship of the sections in the National Association must be used unsparingly. This meeting was rendered exceedingly tedious at times by papers of tiresome length and repetition of ideas. Essayists should be limited to time, and when this is exceeded the gavel of the presiding officer should descend without fear or favor.

Bibliography.

ANNUAL AND ANALYTICAL CYCLOPÆDIA OF PRACTICAL MEDICINE.

By Charles E. de M. Sajous, M.D., and one hundred Associate Editors, assisted by Corresponding Editors, Collaborators, and Correspondents. Illustrated with Chromo-Lithographs, Engravings, and Maps. Volume V. The F. A. Davis Company, Publishers, Philadelphia, New York, Chicago, 1900.

The fifth volume of this Cyclopædia fully maintains the high character of those that have preceded it. The rapidity with which

these volumes have been produced and the care manifested upon every page indicate an energetic and intelligent labor that all must appreciate. The editor says of it, "It has proved to be the most arduous one to prepare of the entire series, involving, as it does, almost every specialty,—otology, laryngology, ophthalmology, neurology, paediatrics, obstetrics, therapeutics, etc., besides the sections usually classed under general medicine and surgery."

The present volume opens under the letter M with "Methyl-Blue" and closes with "Rabies," and covers between these two subjects, through six hundred and sixty-two pages, a series of valuable and thorough papers. One of the most valuable, especially to dentists, is the article on "Nursing and Artificial Feeding." The importance of this not only to the health of the infant, but as preparatory to that troublesome period known as dentition, can hardly be over-estimated. While this does not enter into the treatment of the subject-matter, the whole question of proper feeding is so intimately connected with the evolution of the dental organs that the dental practitioner cannot fail to appreciate this admirable treatise. It is confined to the first year of the infant's life, but this is the important period, and if the instructions given were followed this dangerous period would be passed with less difficulty than is usually experienced where little or no attention is paid to rules of feeding.

The various notices of these volumes, given in this journal as they have appeared, have presented but one opinion as to their value, and these favorable expressions can be repeated here. They have all aimed to give an exhaustive treatment of the various subjects, and have left little to be desired as works of reference. To the busy general practitioner or specialist they have presented full, compact and reliable information, readily obtainable without wearying search through a multitude of authorities. The practice of medicine has become so extended, branching more and more into specialties, that it has become a practical impossibility for even the most learned to keep in step with its progress in all its relations. This work, therefore, simply fills a great need, and becomes an essential part of every professional library.

This volume has been prepared by the publishers with the same careful attention to details as those preceding, leaving nothing to be desired in this respect.

Obituary.

HENRY H. BURCHARD, M.D., D.D.S.

DR. BURCHARD died June 25, 1900, at Redlands, Cal.

This announcement by telegraph, though long anticipated, deeply saddened a large circle of friends in his native city. It has been difficult to become reconciled to the early death of this brilliant writer and teacher.

Dr. Burchard was born in Philadelphia, September 20, 1862, and finished his preliminary education at the Philadelphia High School. In 1879 he entered the engineer class of the United States navy, but left that to take up the study of dentistry.

He began his practical studies in this profession in 1881, and in 1884 opened his own mechanical laboratory in connection with Dr. Robert Nones. In 1885 he graduated as Doctor of Dental Surgery (D.D.S.) at the Philadelphia Dental College. In 1888 he graduated from the Jefferson Medical College of Philadelphia and began the practice of medicine, which he abandoned after three years' experience and returned to the practice of dentistry, which he continued until failing health obliged him to resort to teaching and literary work.

He was made Demonstrator of Anatomy in the Philadelphia Dental College in 1886.

His contributions to dental periodical literature have been varied and important. In 1896 he was elected to the Chair of Pathology and Therapeutics in the Philadelphia Dental College, and continued in this service until obliged to resort to a more congenial climate.

The principal work of his later years, and which contributed largely to the further undermining of an already enfeebled organization, was the editing and the contribution of eight chapters to Essig's "Prosthetic Dentistry." He also wrote several chapters and made one hundred drawings for Kirk's "Operative Dentistry." This laborious work was immediately followed by the preparation of his own book of "Dental Pathology, Therapeutics, and Pharmacology," issued in 1898. He had previously prepared a "Compend on Dental Pathology and Therapeutics." In addition to the before-mentioned works, he revised the dental definitions for Duane's Dictionary, and also performed the same service for Gould's

Dictionary. He wrote sections on *Plastics*, Vol. IV., "*American System of Dentistry*," and revised dental portions in the thirteenth edition of Gray's "*Anatomy*," besides contributing extensively to the illustrations. He was also one of the assistant editors in the science department of *Catching's "Compendium"*. He was a member of several dental societies, also of the Franklin Institute of Philadelphia and the Biological Section of the Academy of Natural Sciences of the same city.

This brief *résumé* of his work furnishes but a limited idea of his untiring industry. He seemed to feel that he must not only work while the day lasted, but far into the nights, and, while he enjoyed social life, he allowed himself but little time for its pleasures.

While he lived only thirty-eight years, he accomplished much more than most men of three score years and ten.

Dr. Burchard was a student of others' work rather than an original investigator; indeed, as he acknowledged to the writer, he had little taste or ability in this direction. His power, however, to grasp the thought of his time and make it his own exceeded that of any one the writer ever knew. Gifted with a remarkable memory, nothing escaped him and, apparently, nothing was lost. Coupled with this he possessed a brilliant force in the use of language, and could hold the attention of his hearers whether in scientific societies or before his classes. The result was that he became a popular teacher. It was pathetic, when suddenly paralyzed while reading in the midst of his family, to witness the efforts of this brilliant mind to find words to express his thoughts.

This was the beginning of the end, and shortly thereafter he removed to Redlands, Cal., and there ended his career and was buried at Hillside Cemetery in that place.

The writer feels that this departure from the active work of earth of one so young and so gifted is something more than the passing on of the ordinary man. He died, as probably he would have desired, full of energy and work to the last, but this life and its results seem to convey a lesson in that it shows there are hours for work and hours for recreation. The mind as well as the body must have periods of activity and rest, but excess in either direction tends to weakness and eventual destruction.

Dr. Burchard leaves no successor in his native city,—one who can take up his work exactly as he left it. The place he filled in

the hearts of those who loved and admired him cannot be filled, but the experiences of this life will remain a memory and an inspiration for us all to labor for his and our profession that the light which he sought to infuse into untrained minds may continue to impart its brilliancy into a larger circle, that the needs of the dental profession may be met and its problems eventually conquered.

Dr. Burchard married Miss Esther Vinson, of Philadelphia, April 30, 1888. She and two young daughters survive him.

CHARLES W. McCALL, D.D.S.

DR. McCALL died June 7, 1900, at Binghamton, N. Y., in his fiftieth year.

Dr. McCall was born in Franklin, Delaware County, N. Y., on August 24, 1850. He was a son of the late Dr. S. H. McCall, for many years one of the most prominent dentists of Binghamton and the State of New York.

Dr. Charles W. McCall was most carefully prepared for the practise of his profession, first as a student in his father's office, afterwards in laboratories and offices in New York, graduating from the New York College of Dentistry in the Class of 1876. He practised for a short time in South Orange, N. J., when he returned to Binghamton to associate himself in practice with his father. After the death of his father he continued the practice, removing it to his own residence at 82 Chenango Street, where he maintained one of the most lucrative practices in this part of the State until his death, which occurred after only one week's illness.

Dr. McCall was one of the most prominent and active members of the Sixth District Dental Society, but so free from selfishness that he much preferred to see its offices in the hands of others rather than his own, but was twice its Vice-President, twice its President, and a member of its Board of Censors at the time of his death.

At the celebration of the twenty-fifth anniversary of the Society he, the son of its first President, was very fitly the presiding officer.

He was a member of the First Presbyterian Church, and prominent in business and social circles in Binghamton.

Since the organization of the Board of Trustees of the Barlow School of Industrial Arts at Binghamton he was a member of that body, also a popular and prominent member of the Dobson Club and the Broome County Country Club.

It is difficult to convey to those who did not know him a proper idea of Dr. McCall, genial, unselfish, sympathetic, ready to listen to the joys or sorrows of all who came to him, as his clergyman said, "Sorrowing with those who sorrowed, rejoicing with those who rejoiced." It did seem when you told him of some good fortune that had befallen you that it gave him more delight than if it were his own; and when grief or misfortune had come to one, he always seemed able to pick out the blessing attendant upon it and make it to you the most prominent feature.

Fond of languages, he found time from a large practice to pursue their study. Of broad culture and artistic tastes, his home was not only a delight to him but to all his friends and visitors. Popular as he was in social and club life, and fond of foreign travel, having travelled quite extensively abroad, yet his devotion was to his home, where he led an ideal life with his wife and son, both of whom were his most frequent companions when the day's work was ended.

Industrious, business-like, yet professionally ethical, always with words of praise for his competitors, dentistry has sustained a loss in his death, his friends and the Sixth District Dental Society of the State of New York an irreparable one.

He was married to Miss Elizabeth Lyon Mandeville April 7, 1880, and is survived by her and one son, John Oppie McCall, a member of the Senior Class of Yale College.

Current News.

ILLINOIS STATE DENTAL SOCIETY.

LIST of officers elected for the ensuing year at the thirty-sixth annual meeting, held in Springfield, May 8 to 11, 1900:

President, J. G. Rend, Chicago; Vice-President, M. L. Hanaford, Rockford; Secretary, A. H. Peck, 93 State Street, Chicago;

Treasurer, C. N. Johnson, Chicago; Librarian, J. T. Cummins, Metropolis City; Executive Committee, C. R. Taylor, Streator; Committee on Science and Literature, A. W. Harlan, Chicago; Committee on Art and Invention, H. J. Goslee, Chicago; Supervisor of Clinics, J. E. Hinkins, Chicago.

Members of Executive Council (terms to expire 1903).—C. B. Sawyer, Jacksonville; M. L. Hanaford, Rockford; C. B. Rohland, Alton.

Board of Examiners.—C. M. Robbins, Carthage; C. C. Corbett, Edwardsville; S. F. Duncan, Joliet.

Committee on Ethics.—C. B. Sawyer, Jacksonville; J. D. Nicol, Peoria; Edmund Noyes, Chicago.

CHICAGO DENTAL SOCIETY.

THE following officers of the Chicago Dental Society for 1900-1901 were elected at the annual meeting, held in the Stewart Building, Tuesday evening, April 3, 1900:

President, Geo. W. Cook; First Vice-President, Geo. B. Perry; Second Vice-President, H. J. Goslee; Secretary, Elgin Ma Whinney; Corresponding Secretary, C. S. Bigelow; Treasurer, A. B. Clark; Librarian, H. W. Sale; Member Board of Directors, Edmund Noyes.

Board of Censors.—W. V.-B. Ames, Chairman; C. N. Johnson, A. W. Harlan.

C. S. BIGELOW,
Corresponding Secretary.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

THE following officers for 1900 were elected at the annual meeting of the Odontographic Society:

President, T. L. Gilmer; Vice-President, L. S. Tenney; Secretary, F. H. Zinn; Treasurer, G. N. West.

Board of Directors.—J. E. Nyman, A. B. Allen, G. B. Perry.

Board of Censors.—A. G. Johnson, Chairman; F. E. Roach, J. B. Dicus.

F. H. ZINN,
Secretary.

THE
International Dental Journal.

VOL. XXI,

SEPTEMBER, 1900.

No. 9

Original Communications.¹

THE EXTRACTION OF LIVING PULPS FROM TEETH
UNDER THE INFLUENCE OF COCAINE ANÆSTHESIA
PRODUCED WITH THE AID OF MECHANICAL
PRESSURE.²

BY WILSON ZERFING, D.D.S., PHILADELPHIA.

MR. PRESIDENT, MEMBERS OF THE ACADEMY, LADIES AND GENTLEMEN,—The extraction of the tooth-pulp has for many years been recognized as a necessity in dentistry, and with it also the necessity of some means of performing the operation painlessly.

As early as 1836 Dr. J. R. Spooner, of Montreal, has been credited with introducing arsenous acid as an agent, or, I might almost say, *the* agent, to render a pulp insensible, and although he first used it alone, it has since been combined with other agents in various formulae, and is used largely even at the present day.

Although perhaps more pulps have been removed from teeth after first having been treated with arsenic than with the combined use of all other means, I think the profession has always felt that arsenical devitalization of pulps for their extirpation has, as a rule, not been as satisfactory as might be desired.

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the Academy of Stomatology, April 24, 1900.

With the advent of cataphoresis we had hoped to be able shortly to entirely abandon the use of this drug, but for various reasons cataphoresis has not proved the boon it was hailed to be, and consequently it was used for pulp-extraction in comparatively few cases only, even in the hands of those possessed of the cataphoric apparatus. In the first place, the requirement of the necessary appliances rendered its use not generally popular, owing, perhaps, largely to the time necessary to properly adjust the same and the uncertainty of its action, especially in the hands of those not careful as to details; although there can be no denying the fact of its utility in rendering the dental pulp insensible to pain under proper and careful manipulation.

In reading a copy of the May, 1899, issue of *Items of Interest*, my attention was attracted by an article appearing in "The Editor's Corner," calling attention to the fact that, "Some certain person, or, rather, some uncertain person, as his identity had not been known, was travelling through the West selling 'a method of painlessly removing pulps,' and charging twenty-five dollars for the secret." In the same article also was divulged the secret, as given by a correspondent, which no doubt many of you have learned.

The simplicity of the treatment seemed to offer such marked advantages over any other means with which we were acquainted that it was considered worthy of a trial, and the result obtained proved most astonishing.

I commenced by using the formula given by Dr. Mitchell, of formalin, one part; absolute alcohol, five parts; and pulverized cocaine crystals, taken up with a piece of spunk previously saturated in the above solution, being careful in each instance to use a piece of spunk no larger than the opening of the exposure. The procedure followed was that outlined in the referred-to article.

At a later period, placed in the position of being without formalin, it was determined to try the alcohol alone with the cocaine, and the result proved quite as successful as with the addition of formalin, so ever since it has proved very satisfactory without the latter.

Following is a summary report of cases thus treated, showing the diversified conditions and positions in which the treatment is applicable, for many of which we are indebted to the clinic at the University of Pennsylvania.

In a few of the cases you will notice a slight digression from

the original in the substitution of eucaine for cocaine, and vapocaine for alcohol, the manner of applying, however, being the same, as well as the effect.

October 11.—Mr. B., aged about thirty-eight. Inferior left second molar, cavity involving the larger part of the occlusal surface; pulp exposed, but conditions apparently favorable for capping; cavity treated, pulp capped, but tooth filled only temporarily with gutta-percha. The treatment proved unsuccessful, and devitalization became necessary. Used eucaine by crushing part of a tablet on a glass slab, taking it up with the spunk previously dipped in vapocaine, and proceeding with the pressure as suggested, all sensation disappearing in a few moments; when on opening the pulp-chamber with a bur, and an attempt made to enter the canals, the chamber was found filled with pulp-nodules, the removal of which caused considerable trouble, as they were quite difficult to dislodge, and by the time the canals could be entered without obstruction an application of the anæsthetic was again made to the pulp at the entrance to each canal, when its removal was accomplished without pain. Four days later the canals were filled with oxychloride of zinc, the tooth doing good service.

November 13.—Mrs. B., aged about fifty-three, applied for the repair of a bridge previously anchored to the inferior left first bicuspid by a very thin, soft, open-faced shell crown, and extending back to the second molar. The fixture had done service a little less than nine months, when the bicuspid shell had gone to pieces. The tooth used for anchorage had been very imperfectly trimmed; in fact, no grinding had been done practically, which necessitated considerably more cutting before a satisfactory repair could be undertaken; the tooth, however, was so extremely sensitive to even ordinary conditions that extraction of the pulp was decided upon. An opening was drilled through the occlusal surface, and with the aid of vapocaine the pulp exposed, when an application of eucaine was made directly to it, as in the previous case, and the pulp extracted entirely without pain, when all trouble as to sensitiveness was at an end. The canal was subsequently filled with oxychloride of zinc.

November 14.—Mr. K., aged thirty. Inferior left first bicuspid, mesial cavity, pulp exposed; sensitive and ached at times. Applied cocaine and, as solvent, ordinary commercial alcohol; the pulp was extracted with very slight pain, and after properly dress-

ing, the canal was immediately filled with oxychloride of zinc, and the cavity filled four days later with tin and gold.

November 14.—Miss L., aged nineteen. Inferior right first bicuspid, mesial cavity; also inferior left first and second bicuspids, cavities approximating; all three pulps exposed and in an inflamed condition, and apparently all three aching at the time of visit. Applied cocaine and alcohol, and extracted all three pulps at the same sitting, the first painlessly, the second almost so, while the third, which had a very small exposure, required a second application, which produced complete anæsthesia. The canals were dressed and filled at a subsequent sitting.

November 15.—Mr. R., aged twenty. Badly broken down superior right lateral incisor, but pulp vital. Excised the remaining portion of the crown with the aid of fissure bur and forceps preparatory to crowning, leaving a very small exposure. Applied cocaine and alcohol, and extracted pulp with no pain at all.

November 16.—Master B., aged twelve. Badly aching inferior left first molar, occlusal cavity, small exposure. Cocaine and alcohol were applied, which permitted of exposing the pulp more freely, when with a second application it was extracted with very slight pain.

November 18.—Mrs. L., aged about forty-five. Inferior left first bicuspid, distal cavity. Arsenic had been applied the day preceding, and now the extraction of the pulp was attempted, but it was found just as sensitive as twenty-four hours previously. Cocaine and alcohol were applied, and the pulp was extracted with comparatively no pain.

November 18.—Mrs. H., aged twenty-four. Inferior left first bicuspid, mesial cavity, pulp exposed and aching. Arsenic had been applied six months before and again removed, leaving the pulp still vital and very sensitive. Cocaine and alcohol were used, the pulp was extracted without pain, and the canal dressed; it was filled at a subsequent sitting with oxychloride of zinc, and the crown cavity with gold.

November 20.—Mr. E., aged seventeen, very nervous. Superior right first bicuspid, cavity involving mesial and distal surfaces, pulp exposed. Cocaine and alcohol were applied, and the pulp was removed painlessly.

November 22.—Mr. P., aged twenty-three. Superior left second bicuspid, distal cavity; tooth treated about three weeks pre-

viciously, patient thought for devitalization; pulp quite sensitive. Applied cocaine and alcohol, and extracted with very slight pain.

November 23.—Miss M., aged eighteen. Superior right second bicuspid, broken down almost to the gum, pulp very sensitive. Applied cocaine and alcohol, and extracted painlessly. Tooth crowned.

November 25.—Miss F., aged twenty. Superior left first molar, occlusal cavity. Applied cocaine and alcohol, and opened pulp-chamber with a bur, removing the bulbous portion, but could not enter canals; after second application the pulp was removed from the palatine canal without pain, but before the buccal canals could be entered a third treatment was necessary, and even then there was slight pain, but not sufficient to prevent their being entered and cleansed.

November 27.—Mrs. L., aged twenty-seven. Superior right lateral incisor, mesial surface. Pulp exposed in excavating, but too shallow to permit of proper capping and filling with gold, which latter had been determined on. Applied cocaine and alcohol, and extracted pulp with very slight pain. After treating properly the canal was filled at the same sitting with oxychloride of zinc, and the crown cavity at a subsequent sitting with gold.

December 5.—Mr. S., aged twenty-seven. Inferior left second molar, occlusal cavity, and extending down over the buccal surface to the gum margin. Applied cocaine and alcohol, and extracted pulp; no pain whatever except during pressure on the rubber, which was very slight.

December 5.—Miss B., aged eighteen. Superior right second bicuspid, cavity on mesial surface; very slight exposure of the buccal horn. Applied cocaine and alcohol, and with a bur exposed pulp more freely and made a second application, when the pulp was extracted in its entirety with very slight pain. Canal filled later with oxychloride of zinc, and crown cavity with gold.

December 7.—Mrs. L., aged thirty-eight. Superior right cuspid, cavity in distal surface. Applied cocaine and alcohol, and extracted pulp with no pain. Time required to anesthetize and extirpate pulp, just *two minutes*.

December 8.—Mr. A., aged seventeen. Superior right first bicuspid, cavity on distal surface, extending well to the cervix. Two days before, December 6, the patient had applied for treatment; the tooth was very sensitive on excavating, as a thin layer

of decayed tissue was left over the pulp and oil of cinnamon sealed in the cavity. Patient returned next day, having suffered the greater part of the night, during which time oil of cloves had brought temporary relief. On opening the cavity it was found extremely sensitive, so carbolic acid was sealed in and the patient asked to call next day, the intention being to apply arsenic after relieving the pulp of its inflamed condition. On presenting, the conditions were about the same. What tissue remained over the pulp was removed, exposing it; an application of cocaine and alcohol was made and pulp exposed more freely with a bur, and after a second application extracted, *with absolutely no pain*. This case took about eight or ten minutes.

December 10.—Mr. E., aged thirty-two, had applied one week previously; the superior right first bicuspid, distal surface, contained a badly leaking amalgam filling, and the tooth was aching. The filling was removed and an exposure found, which was treated with carbolic acid and iodoform sealed in the cavity, thinking the pulp partly dead, and that after a week its removal would be quite easy. On returning December 10, however, it was quite sensitive, so much so that excavation of cavity was impossible. Cocaine and alcohol were applied, and pulp was extracted from both canals with very slight pain. The canals were subsequently filled with oxychloride of zinc and the tooth refilled with amalgam.

December 13.—Mr. M., aged thirty-two. Inferior right first molar, mesial cavity, extending very far under the gum; small exposure. Made a number of attempts with cocaine and alcohol, cocaine, alcohol, and formalin, and cocaine and vapocaine, but each on pressure produced extreme pain, which continued. After persevering for about a half-hour or more, the pulp finally submitted and the canals could be entered painlessly, but in this case the time required and the agony produced would not seem to render the treatment justifiable.

January 6.—Mr. C., aged thirty. Inferior right second molar. On October 31 a very shallow cavity was filled on the occlusal surface with amalgam. About November 14 the tooth began to give trouble, which continued until December 5, when the filling was removed and treatment commenced to relieve the pulpitis, which was continued till December 12 without effect. It was then decided to open into the pulp-chamber and devitalize. After exposing the pulp an attempt was made to relieve the congestion preparatory

to devitalization with arsenic. The pain did not seem to be relieved, however, and the pulp began to puff up through the exposed area, and had all the characteristics of a fungoid pulp, when, on January 6, it was decided to extract it with the cocaine method. After a single application the chamber was opened with a bur and the pulp removed from both canals without any pain. The canals were subsequently filled with oxychloride of zinc, and the cavity with gold.

January 11.—Miss R., aged seventeen. Inferior left first molar, cavity on mesial and occlusal surfaces. Three days previously, while excavating, there appeared a very slight exposure, which was treated with acetate of morphia and carbolic acid preparatory to capping, with instructions to patient to return in three days. On her return there had been a great deal of arbing, so pulp extirpation with cocaine and alcohol was determined upon. After first application the pulp-chamber could be opened and the bulbous portion removed with a bur, but the canals could not be entered. Two other applications were made, one to the entrance of each canal, and all tissue was removed with practically no pain.

January 12.—Miss P., aged twenty-three, very nervous. Inferior left second bicuspid, distal cavity. Cocaine and alcohol were applied as usual; on first pressure considerable pain was produced, which left very suddenly, and after about one minute the chamber was freely opened with a bur and pulp extracted with no further pain.

Same patient four days later. Exposure in superior left lateral incisor, mesial surface. Same treatment was attempted, but on slightest pressure intense pain was produced, which would not subside; the operation was tried repeatedly, with the same result, till at last the patient became too nervous and refused further attempts; finally after some persuasion she submitted to one more trial, with the assurance that it should be the last; the pain seemed as intense as before when pressure was applied, but suddenly it began to grow less and soon ceased entirely, when the pulp was extracted without further trouble.

January 15.—Miss B. M., aged twenty. Superior left first bicuspid, distal surface. After one application the pulp was extracted, although with some little pain.

January 16.—Miss S., aged twenty-two. Inferior right second molar, cavity occlusal, exposure small. After one application the

pulp was removed without any pain. Canals were filled one week later with oxychloride of zinc, and the cavity with amalgam.

January 17.—Miss L., aged twenty-four. Superior left second bicuspid, mesial cavity. Made five or six trials, but each proved so painful that further attempt was abandoned and arsenic resorted to.

January 18.—Miss H., aged twenty. Superior left second bicuspid, distal cavity. Made one application and removed pulp without pain.

January 19.—Miss D., aged sixteen. Inferior right first molar, occlusal surface; had been treated three days previously with oil of cloves to relieve toothache. After one application of cocaine and alcohol the pulp was removed with very slight pain.

January 19.—Miss C., aged twenty-eight. Inferior left third molar, occlusal surface, large exposure, aching badly. After one application the pulp was removed without any pain.

January 19.—Miss E. M., aged thirty-eight. Inferior right first bicuspid, distal surface; exposure at the cervical portion of a leaking cement filling. Three days before an application of arsenic, carbolic acid, and iodoform was made, but on attempt at removal of pulp it was as much alive, so far as sensation was concerned, as three days before, so cocaine treatment was used and pulp removed with no pain.

January 25.—Miss K., aged seventeen. Superior right first bicuspid, distal cavity. Oil of cloves had been sealed in two days before, giving entire relief, although previously it had ached badly. After one application of cocaine and alcohol the pulp was removed from both canals absolutely painlessly, although coming out in shreds.

February 6.—Miss C., aged eighteen, very nervous. Inferior left second molar, occlusal exposure. Made a number of attempts with cocaine and alcohol, but the pain on pressure was so great and continued that the treatment had to be abandoned as a complete failure in this case.

February 13.—Miss I., aged seventeen. Superior left first bicuspid, distal surface, pulp congested. One application. No pain at all upon extraction.

February 13.—Miss O., aged eighteen. Inferior left second molar, mesial cavity. Required three applications, but was extracted almost painlessly.

March 1.—Mrs. L., aged forty. Inferior right first bicuspid, distal cavity, pulp exposed and bleeding during excavating. Applied cocaine and alcohol, and extracted pulp with very slight pain.

March 21.—Miss M., aged twenty. Superior left second bicuspid, cavity including mesial, distal, and occlusal surfaces; slight mesial exposure, pulp congested. After first application the exposure was enlarged and a second treatment applied, after which the pulp was extracted with no pain at all.

This makes a collection of thirty-eight cases given in the order in which they presented, accepting the conditions as they appeared, without any attempt to shirk apparently unfavorable cases.

I shall not pretend to say, but leave it to your judgment, whether or not from the list of conditions given, together with the results obtained, the treatment is worthy of being advocated. To myself it has proved eminently satisfactory.

I should like to append to the above a few words on a method we have more recently been using in an experimental way to anesthetize pulps, which is the injection of chloroform with the hypodermic syringe, using a very fine needle. By bringing the needle point just to the exposed tissue and immediately forcing a drop of chloroform on to the tissue, at the same instant also forcing the needle point into it, together with additional chloroform. The needle may in this way be forced with little or no pain well into it, when, after a few drops of additional chloroform have been injected, the pulp can instantly be extracted without the slightest sensation. It requires no waiting after injecting, and all appliances should previously be prepared, such as the engine with bur to open the pulp-chamber freely if necessary, and whatever extractors or broaches are to be used.

I have recently very successfully taken pulps from incisors, cuspids, bicuspid, and molars without regard to the condition of pulps; also where any sensitive tissue has been left in root-canals with the rest of the pulp dead and perhaps removed, if the needle point can be inserted and a few drops of chloroform forced in, the previously sensitive tissue can be extracted without any pain, while previously perhaps the sensitiveness was so great as to make entrance with a broach impossible. I am using this method quite extensively at present, although time has not permitted the gathering of data to be presented herewith.

Mention of it is made at this time with the hope that some of

those present may try it and find it in very many cases even preferable to the cocaine and pressure method. Where a patient presents with an exposed pulp and a violent toothache, the pain can be almost instantly relieved by this treatment, and after the injection the pulp can be extracted without even the slightest sensation.

SOME METHODS OF EXTIRPATING PULPS AND SUBSEQUENT TREATMENT.¹

BY DR. JAMES B. LOCHERTY.

MR. PRESIDENT AND GENTLEMEN,—The many cases indicating the employment of arsenous acid preparations, or some other method for the purpose of destroying the dental pulp, owing to the extreme sensitiveness of it, are in a measure some excuse for the numerous papers which have been presented before the different societies from time to time, and with your kind indulgence I will submit the following paper, in which I shall endeavor to set forth as briefly and concisely as possible some of the methods adopted in extirpating pulps, theories regarding such methods as to the danger, if any, which might possibly attend the use of certain agents employed for that purpose, and, finally, some considerations respecting the subsequent treatment after the removal of the pulp.

For convenience the methods will be classified as medicinal and surgical. Under the former, arsenous acid preparations will be considered, while in the other, or surgical method, cocaine, separately or in combination with some other agent, will be mentioned.

As to the medicinal treatment: For many years arsenous acid preparations have had many advocates, and those who have had a long and varied experience in the use of them have, by making applications judiciously, destroyed the pulp in a practically painless manner, while, again, many practitioners have contended that its employment should be dispensed with and a suitable substitute used.

¹ Read before The New York Institute of Stomatology, April 3, 1900.

Several months ago a paper appeared in the *Dental Cosmos* on the uses of arsenous acid, by an advocate, in which he contended that it was "less painful and less dangerous to dental tissue and the general health of the patient than some of the means suggested as substitutes." He also stated that "it is a successful and conservative method, and although it has been abused in some instances through carelessness and ignorance, yet an intelligent application of it is legitimate and scientific practice;" and among other things was a formula for an arsenous acid paste, also the therapeutic actions of the respective drugs employed therein and the satisfactory results obtained; and, in concluding, the writer stated that if, through carelessness of the patient or from other cause, the periodontal membrane becomes inflamed, by applying liquid dialyzed iron the toxic effect would cease, as the arsenous acid would form arsenite of iron. While another practitioner, opposed to the use of arsenous acid, stated that the practice of applying poisonous escharotics, such as arsenous acid, should always be avoided, with the appliances and facilities now at the command of every dentist. "The use of such agents is wholly unnecessary, and especially so when it is considered that the most serious results follow their use in some instances, in either the immediate or remote future, and especially in the cases of those highly susceptible to the poisonous influences of arsenous acid or similar agents; specific results in some instances occurring in twenty-four hours. The results, however, may in other cases be delayed for weeks or months before manifesting any action in a marked manner."

Now, the opinion of the gentlemen just quoted are simply illustrations of the widely different views which are maintained on this subject, and while we are loath to believe that such opposite views are universally held by all the members of our profession to-day, still there are a vast number who, according to their past experiences, would readily take sides with one of the above views; but were one to look at the subject dispassionately, the conclusion would probably be, that in both the medicinal and surgical method there is much to be commended, allowing that some particular method be adopted which has stood the test of time and experience successfully, notwithstanding that the physiological and pathological action of any particular agent may be fraught with much danger. But in the adoption of a plan for the extirpation of the dental pulp, the first consideration should be the use of that

method which will be the more scientific; that is, not only should the manner of application be thoroughly understood, but also certain considerations regarding either the physiological or pathological action of the agent or agents employed in the treatment; also as to which is the more favorable condition present for the future preservation of the tooth-structure after the extirpation of the pulp.

In considering the medicinal method, the principal agent being arsenous acid, a standard work informs us that it is a powerful caustic; an internal dose is a very severe gastro-intestinal irritant, in minute doses a gastric stimulant causing dilatation of the gastric vessels. As to its effect upon circulation, it says, "The rapidity and force of the pulsation is lessened until it finally stops. It is eliminated by the urine, the alimentary canal, the skin, the saliva, the milk, and even the tears; it may be found many years after death in the bodies of those who have taken it in life. Dose, one-sixtieth to one-tenth of a grain. As a drug it certainly in some way alters the condition of the sufferer, and is vaguely called an alterative." Of course, the above is in general therapeutics. Its action, however, may be considered a purely local one when confined to the pulp-cavity and used in infinitesimal quantities. It is probably owing to its being a strong irritant that many practitioners believe that its action distends the vascular tissues, which causes the pulp to be destroyed by strangulation. One writer in *Items of Interest*, for May, 1898, says that, "most vasomotor nerve-fibres of the sympathetic system having been found to possess constrictor and dilator functions, when injured or acted upon by certain medicinal agents the vasodilator function persists for some time longer than the vasoconstrictor action;" he suggests that, "may we not find in this fact an explanation of arsenous acid in the destruction of the pulp?" "the first action being the paralyzation of the vasoconstrictor fibrils; the vasodilator function continuing, the blood-vessels becoming rapidly engorged, the pulp dies from exhaustion." While another theory is that arsenous acid forms a chemical combination with the hæmoglobin of the blood, called arsen-hæmoglobin, and through its toxic power causes structural degeneration of the cellular elements, followed by the death of the tissues as far as the arsenous acid has penetrated and formed arsen-hæmoglobin (*Dental Cosmos*, September, 1899). Notwithstanding our absence of precise knowledge

as regards arsenous acid, it has certainly performed its mission in the destruction of the pulp; but it is owing to its dangerous properties, and also that permanent relief may be given a patient suffering from a congested or inflamed pulp, a relief not always attended, when arsenous acid is applied, until a certain period of time has elapsed,—a sufficient period to cause devitalization of pulp,—that has caused us to abandon the use of arsenous acid preparations and use the surgical method in its stead, believing it to be a more scientific method.

The employment of cocaine, either separately or in combination, is, of course, as you all well know, not absolutely without danger. As to its action, we are informed that "it constricts the arterioles, that a two to ten per cent. solution is sufficient to anesthetize the sensory nerves, while a larger dose is necessary to similarly affect the motor nerves." "As to its action upon the respiratory centre, it first stimulates it, so that the rapidity and depth of respiration are increased; but soon depression of the centre follows, the respiratory movements become feeble, and death takes place from asphyxia. There are, however, several antidotes suggested in the use of hydrochlorate of cocaine, suprarenal extract (as suggested by Dr. Dawbarn), whiskey, or strychnine, but in the minute doses and the manner in which it may be applied locally when necessary for the extirpation of the dental pulp, the toxic power of cocaine may be reduced to a minimum; in fact, experience has taught us that, in the exercise of extreme caution in its application, not the slightest fear need be entertained as to any serious conditions likely to arise in its use when extirpating dental pulps, if the following precautionary measures be adopted, which are, that the rubber dam be used in every instance where practicable; conditions existing where it is impossible to adjust the rubber dam, other measures must be employed in order to confine the agent to the tooth or cavity in question and avoid its being absorbed by the mucous membrane, the great point being to exclude all moisture or exudations from the surrounding tissues.

Several methods are employed in applying cocaine, such conditions, for instance, as the position of the tooth, location and extent of cavity governing the special method to be adopted. A few typical cases will serve to illustrate.

CASE I.—Upper right cuspid; condition of mouth wherein it was advisable to extirpate pulp; applied rubber dam and ligatured

it to tooth; ground off enamel on palatal portion about on direct line with pulp. When reaching dentine used drill (spear point) for short distance, then applied, in this particular instance, vapocaine (an etherealized solution of cocaine), although a saturated solution of cocaine, or even ten per cent. solution, would answer the purpose, but we believe it is not readily absorbed. After a few moments the drill was again used until sensitive dentine was reached, when the application was repeated, and with an ordinary amalgam plugger applied pressure to small piece of unvulcanized rubber to the drilled cavity, believing that in so doing the cocaine is made to penetrate the dentine more rapidly. After allowing ample time to elapse for the obtunding of the dentine, used cocaine on approaching sensitive dentine, again applying solution, thus continuing cautiously until enabled to enter pulp-chamber with practically no more pain than a patient would experience in excavating a slightly sensitive tooth. The condition present upon reaching the pulp seems to be that the cocaine has constricted the blood-vessels in it, so that it not infrequently happens that we are able to enter the pulp-cavity without causing any hemorrhage whatever. The hypodermic syringe is then used, and a ten per cent. solution of hydrochlorate of cocaine, or saturated solution, injected, say a drop or so, and allowed to more completely anæsthetize the pulp. After a few more moments had elapsed, was enabled to enlarge, by means of rose bur, an artificial cavity to pulp; then by aid of Donaldson's nerve-broach, without handle, taken between thumb and forefinger, and by a rotary or rather twisting or screwing motion, was enabled to pass it up alongside of pulp and extract it in a painless manner. The above instance is a typical case, the patient being of a highly nervous temperament, the operation occupying about thirty minutes.

CASE II.—A Miss N.; upper left second bicuspid, cavity distal approximal, pulp slightly exposed; applied rubber dam and ligatures to necessary teeth and then adopted the following method: Used crystals of hydrochlorate of cocaine to pulp, allowing ample time for absorption, then by means of instrument worked crystals into pulp-chamber and applied a piece of unvulcanized rubber, using pressure to hold it there for a few moments; and was then enabled, after enlarging the pulp-canal, to remove the pulp. For this method we are indebted to Dr. Watkins, of Montclair, who learned of it, we believe, at the National Convention a few

years ago. We must confess that the method of procedure did seem rather heroic, but it is astonishing with what rapidity a pulp may be extirpated, and at the same time with but little pain, especially if we allow from twenty to thirty minutes for absorption of crystals of cocaine.

CASE III.—Mr. R.; lower left first molar pulp; owing to exposure, cavity slightly inflamed, in this instance situated in the mesial portion, near cervical margin of tooth. In this instance did not apply rubber dam, but by means of bibulous papers and varnish was enabled to keep surrounding parts quite free from moisture. Upon removing filling on mesial approximal portion, was enabled, by means of saturated solution of hydrochlorate of cocaine, to reach pulp-cavity in a similar manner as referred to in Case I.; then applied sulphuric acid C. P. and cocaine, equal parts, to pulp, applying pressure by the aid of unvulcanized rubber; the sulphuric acid, having a great affinity for water, seems to disintegrate the pulp after causing some little pain, not sufficient, however, to cause the patient any great discomfort. By thoroughly enlarging the pulp-chamber I was able to remove its contents, and then, after washing out in a manner shortly to be described, applied the above solution to the individual canals, applying pressure in the manner as before described, and removed contents from canals.

Case III. is cited as an instance of the great vitality which some nerves seem to possess, for the tooth had not only troubled the patient for some months, but it was also difficult to extirpate—the sulphuric acid C. P. with cocaine is a formula that I would not unhesitatingly recommend, for there is a possibility of some pain attending its application; at least, that has been my experience with it, although it will be found excellent for extirpating so-called nerve-stumps or filaments at the end of root-canals; but in Cases I. and II. the method may be adopted and applied with uniformly excellent results, the duration of time extending from ten minutes to an hour, depending upon existing conditions. Of course, many other methods have been used, such as emuine, nitrous oxide gas, ethylchloride, cataphoric and air-pressure, with various success, although having used cocaine as described in the above cases, especially I. and II., with results that have been decidedly satisfactory. I am perfectly willing to continue the treatment until a superior method, especially as to time and safety, may be suggested as a substitute. As to the subsequent treatment

in instances where the pulp has just been extirpated and the rubber dam is still in position, the pulp-canal is cleansed by forcing warmed distilled water, by the aid of the hypodermic syringe, until the contents are thoroughly removed, then partially wiping the roots. Sulphuric acid, fifty per cent. solution, is applied,—*i.e.*, equal parts alcohol and sulphuric acid,—and a few drops of oil of cassia, care, however, being exercised so as not to force it beyond the apical foramen. After applying this agent for a few moments the canal is dried by hot air, the absolute alcohol and hydronaphthol are applied, and the canal filled with chloropercha and gutta-percha cones. This is the general treatment, although other methods are sometimes adopted.

The improvement in the treatment of root-canals has been as marked as other methods have along similar lines in matters pertaining to our profession, and all appreciate the fact that it is absolutely essential to surgically cleanse the canal. There have been many excellent instruments devised for that purpose, in the shape of improved highly tempered nerve-broaches and nerve-canal drills, to remove organic matter which might cause trouble at a future time, yet the physical characteristics presenting themselves in the form of tortuous or irregular canals confront us with a condition in which it is not always practicable to thoroughly remove the pulp in its entirety. What is the best method of treatment to adopt? Of course, if we can employ an agent which will chemically change the remaining contents of the canal into a permanent sterile condition, that will no longer be a source of much annoyance. We still have to consider one or two points suggesting themselves, which are the albuminous matter in the dentinal tubuli, the methods used in attempting to place these tubuli in an aseptic condition, the manner in which agents act producing asepsis, and their germicidal power and stability.

An authority some time ago stated that investigation tended to show that the absorption of liquids into the dentinal tubuli was by osmotic action, and that coagulants soluble in water would diffuse through tooth-structure, and also that oleaginous non-coagulants also passed through the tooth-structure, although slowly in the presence of water in serum albumin; farther on stating that the function of water in the tubuli was necessary as a carrier of medicinal agents.

This point was simply made touching upon what we believe

the importance of moisture or water being present in the tubuli, at least, of the root, to assist us in medicating tooth-structure, except in instances where air pressure is used. As to the antiseptic properties of agents, it is well known that under different conditions their actions vary greatly, as, for instance, the action of iodoform, in culture mediums, being an indifferent substance, while in diseased condition it manifests strong antiseptic qualities. "The power of antiseptics depends upon the temperature at which they act, the medium in which they are dissolved, the strength of the solution, the time given them to act, and micro-organisms present in the substances to which they are added." This being the case, it behooves us to use such antiseptics in our treatment as will be quick in action, at the same time being permanent or stable, and while I believe we have not yet been able to find an antiseptic with the latter quality, yet we are fortunate in having many at our command to-day, the application of which, if the proper surgical work be performed at the beginning, will, in almost every instance, place the canal in a thoroughly aseptic condition; then by a suitable root-filling, the patient will have a tooth which will cause him in a vast majority of instances no further trouble in this direction.

DENTAL WORK AMONG THE POOR; HOW CAN IT BEST BE ACCOMPLISHED?¹

BY H. A. KELLEY, D.M.D., PORTLAND, ME.

I AM pleased to appear before you to discuss the question of dental work among the poor, because it is a question that, however much you may individually have thought upon it, if I am to judge by my reading of the dental journals, has received almost no attention at our society meetings.

I hope to make this a discussion in which this paper will be only the opening, for my study of the subject has not left me with well-defined opinions which I can give you with a reasonable hope that they are right and final, nor has the practical experience I have had in this work given results any more emphatic. In my

¹ Read before the Northeastern Dental Association, October, 1899.

consideration of the social and ethical side of the question those of you who are familiar with your Spencer, Huxley, and Mills will recognize that I have drawn from their works quite largely. Also I shall be obliged to consider general charity and its data, and from that reason to dental charity, because there are no data upon dental charity at my hand except the small amount deducted from my own experiments.

I have said this subject has received but little attention at our society meetings, but in 1896 R. C. Newton, M.D., read a paper, which stands out almost alone, before the New Jersey State Dental Society, entitled "What shall be done for the Teeth of the Poor?" Dr. Newton says, "A poor man can have his every bodily ailment and deformity gratuitously treated, and that, too, by the best available skill, except his teeth,—perhaps the most generally important and necessary of all the special organs. This long-felt want will surely be filled. . . . The higher position a man attains in the medical profession the more time and thought must be given to charitable work. So the dentists, if they wish to be esteemed by the public generally as specialists of medicine, must give their time and skill to treating the poor. They must do as the oculists and the aurists do or give up, in some measure at least, the place which they deserve to hold among their professional brethren. It is willingness to give time, thought, and skill to the service of the poor which has elevated and ennobled the profession of medicine. It is this that has made it the most generally beloved and respected of all the professions."

In July, 1896, I read a paper before the Maine Dental Society entitled "What Dentistry owes the People." In that paper I said, "When a profession is known, or believed, to be working for humanity and not for hire alone, then it is upon a high plane not only in its own estimation, but in the estimation of the people of the world. Because you need my services I give them to you, not because you pay me money. This is the spirit in which we should work. Now, dentistry does owe the people something, and when we give them that something we will stand beside the liberal professions. You all know that dentistry is doing almost nothing for the poor. We have no charitable hospitals. You and I do something in the charitable line, but are we doing all that we owe the poor? I think not."

I will not quote further from that paper now, but I introduced

it here for the double purpose of showing you, first, that at the same time Dr. Newton was reading his paper I was writing mine, and that his thoughts were nearly repeated by one of the profession. As a result of my work, of which this paper was a part, a free dental clinic was opened in Portland, Me. Let me quickly sketch my experience in this work, that you may know something of the preparation I have had before writing this paper. After it occurred to me that dentistry owed the people something I started to help pay the debt.

After some preliminary work the paper I have mentioned was written and read before the Maine Dental Society, and afterwards a popular edition, if I may so term it, was published in one of the Portland daily papers as an aid to securing subscriptions for a dental infirmary.

Enough money having been subscribed, and a home having been offered us at the Maine Eye and Ear Infirmary, a free dental clinic was established. This infirmary had free clinics, in the out-patient department, in all the specialties of medicine except dentistry, and it was thought best to add our dental clinic to this institution. With the money donated we purchased our special instruments and material. Drs. D. W. Fellows, S. A. Packard, and myself were elected Surgeons in Oral Surgery and Dentistry in the out-patient department of the Maine Eye and Ear Infirmary, and we began our operations, each giving two clinics a week. After a year of this work I again read a paper before the Maine Dental Society entitled "A Year's Work among the Poor," in which I gave an account of the workings of our clinic. And now, gentlemen, I come before you with the experience and preparation to discuss Dental Work among the Poor; How can it best be accomplished?

Marcus Aurelius Antoninus quotes Democritus as saying, "If you would live at your ease, manage but a few things," and then says, "I think it had been better if he had said, 'Do nothing but what is necessary and what is in accord with the reason of a social being.'" For by this rule a man has the pleasure of making his actions good. For the greater part of what we say and do being unnecessary, if this were but once retrenched we should have both more leisure and less disturbance. And therefore before a man sets forward he should ask himself this question, "Am I not upon the verge of something unnecessary?" I asked myself this ques-

tion three years ago, as I may show, and also my reply, by the following from my paper: "I simply mention these things (some of the evils of charity) to show I realize the dangers of charity as practised to-day. But however far charity may have been overdone in this world, surely dentistry has not transgressed that way." That was my answer three years ago. I shall answer it again to-day in the light of my added experience.

That you may not think I have suddenly changed my views, let me quote from my second paper reporting my year's work at the clinic: "It was when we came to actually begin operations, however, that we found ourselves face to face with many serious questions, and some of these questions I have not been able to answer to my satisfaction yet." Nor has the past year answered them, though I feel somewhat more sure that my beliefs are right. Lecky says charity really came into the world with Christianity, and it is interesting to note that as soon as it arrived came the abuse of it. "Long before the era of Constantine (A.D. 274-337) it was observed that the charities of the Christians were so extensive—it may perhaps be said so excessive—that they drew very many impostors to the church." And it is interesting, while we are quoting Lecky, to read that it was a Roman lady named Fabiola who in the fourth century founded in Rome, as an act of penance, the first public hospital; as it tells us, medicine began its charitable work early in the history of charity.

That there is need of charitable work in all the walks of life there can be no question, but is this charitable work being done in the way that would best advance society? In early societies there went, along with the dependence of inferiors, a certain kind of responsibility for their welfare. Along with gradual substitution of the system of contract for the system of *status* this relation has been changed in such a manner that while the benefits of independence have been gained, the benefits of dependence have been lost. The poorer citizen has no longer any one to control him, but he no longer has any one to provide for him. So much service for so much pay, and the money having been paid for the service, no further claim is recognized. The ancient *régime* of protection and fealty has ceased, while the modern *régime* of beneficence and gratitude has but partially replaced it. May we not infer with tolerable certainty that there has to be reinstated something akin to the old order in a new form? Already such

moral ties are in some measure recognized. Already all householders moderately endowed with sympathy feel bound to care for their servants during sickness, and even corporations, that are said to have no souls, make provisions for their help, *vide* the new rules of the Pennsylvania Railroad.

The sole requisite seems to be that usage which thus shows itself here and there irregularly should be called into general activity by the gradual disappearance of artificial agencies for distributing aid.

Besides re-establishing these closer relationships between superior and inferior which during our transition from ancient slavery to modern freedom have lapsed, and besides bringing beneficence back to its normal form of direct relation between benefactor and beneficiary, this personal administration of relief would be guided by immediate knowledge of the recipients, and the relief would be adjusted in kind and amount to their needs and their deserts.

When the responsibility fell directly on each of those having some spare means, each would see the necessity for inquiry and criticism and supervision; so increasing the aid given to the worthy and restricting that given to the unworthy. People who think that the relations between expenditure and production are so simple naturally assume simplicity in other relations among social phenomena. Is there distress somewhere? They suppose nothing more is required than to subscribe money for relieving it. On the one hand, they never trace the reactive effects which charitable donations work on bank accounts, on the surplus capital bankers have to lend, on the productive activity which the capital now abstracted would have set up, on the number of laborers who would have received wages and who now go without wages; they do not perceive that certain necessities of life have been withheld from one man, who would have exchanged useful work for them, and given to another, who persistently evades working. Nor, on the other hand, do they look beyond the immediate mitigation of misery. They deliberately shut their eyes to the fact that as fast as they increase the provision for those who live without labor, so fast do they increase the number of those who live without labor; and that with ever-increasing distribution of alms there comes an ever-increasing outcry for more alms. And we must remember the first charity a person will accept is free medical treatment. Per-

sons that cannot be induced to ask for free food or fuel or clothes will with avidity embrace the opportunity to obtain free medical treatment, and the acceptance of free medical attendance is the first step towards pauperism.

There is already a tendency towards what is generally known as nationalism,—a belief among the common people that the city and the State owe them a living, and that medical attendance, among other things, should be furnished them by common taxation, regardless of their financial standing as individuals. I will not use much time on this phase of the question, for I do not think it worthy of it here, but let me give you just one item. One investigator of the situation in the West, about the time of the last presidential election, gave it as his honest opinion that uncharitable charity is more responsible for the condition of things there than the silver question or the tariff question or anything else. And he said further that “the people of the West (the common people at least) look to Washington and its legislation to remedy the condition in the West when help can only come from within themselves.”

Less objectionable than administration of poor relief by a law established and coercive organization is its administration by privately established and voluntary organizations, says Spencer. For, though the vitiating influences of coercion are now avoided, the vitiating influences of proxy distribution remain.

The beneficiary is not brought in direct relation with the benefactor, but in relation with an agent appointed by a number of benefactors.

The transaction, instead of being one which advantageously cultivates the moral nature on both sides, excludes culture of the moral nature, as much as is practicable, and introduces a number of bad motives.

With this study of general charity let us approach the study of medical charity work, our nearest type, and dental charity work, our special field.

Medical charity work is growing out of the “individual ministration” that Spencer calls “the normal form of ministration” into beneficence administered by compulsory, or more often non-compulsory, social machinery. And I venture to say it was this individual ministration of the older practitioners that made medicine the most generally beloved and respected of all the pro-

fessions, and not the machinery of the hospitals and the infirmaries.

What I know of medical hospitals and infirmaries makes me doubt if this tendency of the medical profession is in the right direction. But this is perhaps the one question more than any other I would not like to try to answer definitely to-day.

That hospitals and infirmaries are doing great good there can be no doubt, nor, again, can there be any doubt they are doing immense harm. Spencer, after considering the evils of general charity, says, "Nor is it otherwise with institutions thought by most people to be indisputably beneficial,—hospitals and dispensaries."

The first significant fact is that thirty per cent. of the people of London are frequenters of them, and the largeness of this proportion makes it clear that most of them are able to pay their doctors.

Gratis medical aid tends to pauperize in more direct ways. The out-patient begins by getting physic, and presently they get food; and the system leads them afterwards to openly solicit pecuniary aid. This vitiating effect is proved by the fact that during the forty years of 1830 to 1869 the increase in the number of hospital patients in London has been five times greater than the increase of population, and as there has been but a very small, if any, increase in disease, the implication is obvious. Moreover, the promise of advice, by the best available skill, for nothing attracts the mean-spirited to the extent that the poor are now being gradually ousted out of the consulting-room by well-to-do persons,—twenty per cent of the out-patients in one hospital having given false addresses for the purpose of concealing their identity. Most of these were without doubt impostors, though pride may account for a few.

Two papers written the last year by B. S. Coker, the Comptroller of New York City, and F. H. Giddings, Professor of Sociology in Columbia University, give me the means of studying the charity work of that city. Giddings says, "The appropriation of public money to private institutions has become a scandalous abuse, but we shall never understand its strength until we frankly face the fact that the public has been experimenting with it, hoping thus to find a way of escape from the greater abuse that attends the administration of public relief by public agencies, ex-

cept when they are incessantly watched and held up to the broadest light of publicity by the disinterested efforts of private citizens. If private organizations are encouraged to do all in their own power under a system wherein the State grants them aid under strict conditions, lays down necessary rules for their government and guidance, and remorselessly exposes all their transactions, the actual result may be better in the long run than if State and private associations proceed independently of one another, often duplicating each other's work, or, if not that, working at cross purposes."

Coler says, "It is easier for an industrious and shrewd professional beggar to live in luxury in New York than to exist in any other city in the world." New York City gives annually five million dollars directly and two million dollars indirectly to public charity. This is almost twelve per cent. of the money raised by taxation for city purposes proper.

More than three million dollars of this money is paid to private institutions and societies over which the city has no control. As the city pays one hundred and ten dollars per year for the support of a child and a hundred and fifty dollars per year for an adult, and as the children are in excess, this sum would feed and clothe more than forty thousand people. Of the five million that New York City spends directly in charity, two million is absorbed by salaries and expenses, some institutions spending sixty to eighty per cent. of the money granted in salaries and one ninety-four per cent. These figures show something of what Spencer calls the cost of social machinery; and, Coler says, there is no evidence they are dishonest, but they are, as a rule, conducted by men and women whose motives are good, but who have no experience or practical knowledge to fit them for the management of a charitable institution. They are easily imposed upon by professional beggars, and in most cases fail in their well-meant efforts to reach and relieve the deserving who are in actual need.

Coler admits that when the city expends its money itself it does not do much better, for of the two million spent that way five hundred thousand is paid for salaries. For every five dollars paid by the city treasurer to relieve the sick and destitute two dollars is absorbed by the salary and expense account. As seen by Coler, the chief abuses of the present system of public charity "are the extravagant expenditures for salaries and the steady and rapid increase of pauperism, due to the misdirected efforts of the

inexperienced persons who control so many of the smaller societies that receive city money." How great this increase has been is shown by the fact that of the two hundred and twenty charitable societies of New York helped by the city over one hundred have been organized in the past ten years.

Many of the great American cities can show a better result than New York, but Giddings says this is due almost wholly to the enormous extension of private as over against public charity in these other cities.

These experiences unite to show that whatever benefits flow from hospitals and infirmaries are accompanied by grave evils,—evils sometimes greater than the benefits.

They force on us the truth that, be it compulsory or non-compulsory, social machinery wastes power and works other efforts than those intended. In proportion as beneficence operates indirectly instead of directly, it fails in its end, says Spencer. Beneficence which takes the form of giving material aid to those in distress has the best effects when individually exercised. It is true, however, individual beneficence often falls short of the requirements, often runs into excesses, and is often wrongly directed. At any rate, it must be admitted that individual ministration to the poor is the normal form of ministration; and that made more thoughtful and careful, as it would be if the entire responsibility of caring for the poor devolved upon it, it would go a long way towards meeting the needs, especially as the needs would be greatly diminished when there had been excluded the artificially generated poverty with which we are surrounded.

"Within the intricate plexus of social relations surrounding each citizen there is a special plexus more familiar to him than any other. Every one who can afford to give assistance is brought by his daily activities into immediate contact with a cluster of those who are severally liable to fall into a state calling for aid; and there should be recognized a claim possessed by each member of this particular cluster."

Can the evils be eliminated, and would hospitals and infirmaries then be the best media for extending medical and dental aid to the poor? I have my doubts whether all the evils can be eliminated, but I am quite certain if they could we would have in them the best system for doing charitable work in medicine and dentistry as well.

Where my doubt arises is, with the evils it seems possible to eliminate removed and those it seems impossible to eliminate remaining, would hospitals and infirmaries then be the best solution of the question? Of course the greatest evil is the use of them by the people who are able to pay, thus working all the harm that any misdirected charity does. How great this use of them by the well-to-do people is I have shown. I believe this evil can be remedied. Much thought is now being given to this subject, and it seems simple enough to devise a method that will make at least a vast improvement here.

Dr. Clarence J. Blake, of Boston, in a paper entitled "A Hospital Clearing House," read before the Massachusetts Medical Society last June, recommends a clearing house for hospitals, and says, "A clearing house in other lines of business (than banking) has come to be a central bureau not only for the establishment and maintenance of balances, but for such co-operative investigation as may constitute it a bureau of information as well; and it is readily conceivable that the establishment and maintenance by hospitals in a large city of an officer to whom, or a bureau to which, there could be referred, for more leisurely investigation, pecuniarily doubtful cases, would not only relieve the individual administrator of a part of a most unwelcome task, but would in time become a channel through which there should flow interchange of ideas, and from which there should emanate to the public instructive information as to the rights as well as the obligations of hospitals."

Dr. Emma Culbertson, some years ago, referring to the exclusion of the unworthy from these charitable institutions, says, "The sifting out of improper cases is a complicated and delicate task. Experience seems to prove that it is better to delegate such investigation to a single official in each institution. Much economy of effort, however, with greater increased efficiency, will result from the establishment of a central bureau to which all charitable institutions of the city should report, and in which the information collected will be easily accessible." This would make it impossible for impostors refused at one institution to obtain admission at another less careful, and establish a black-list of impostors.

Another very grave evil is, the clinicians are responsible for the admission of large numbers of impostors through their unseemly desire to show in the annual report large clinics instead of aiming at pure ones. They should be encouraged in their efforts

to do a large amount of charitable work, but nothing can excuse them for taking as charity patients those known to be able to pay, or, if there is only a suspicion, of taking them without thorough investigation.

Still another evil is that so many of the hospitals and infirmaries either receive a patient absolutely without charge or else will not receive him at all. True charity demands that each case should be individually examined, and that the patient should pay as near the regular charge as he is able. Where this money should go I have not the time to discuss. I believe that many institutions are now charging a small fee, but this is a very serious question.

Then there is the vast amount of money spent in the hospitals which represents a part of what Spencer calls "the cost of social machinery." Could the money it costs to build and maintain our hospitals and infirmaries be better used if spent directly upon the poor? Spencer thinks it could, but I believe it very doubtful. I think the first three evils I have mentioned are the greatest evils of the hospitals, and with these eliminated I think we would have the model which dentistry should use in its charitable work.

Now to return to our clinic in Portland. As I have said, there was no attempt to advertise the fact we had one. We believed all the work we could do would find us. We informed the charitable institutions of our city of its existence, and in this way secured patients of known need from the St. Elizabeth Orphan Asylum, the Maine School for the Deaf, the Temporary Home, and the Gospel Mission, all charitable institutions of known worth. Also the contributors to our fund were requested to send to us any persons known by them to be needy, and workers in charity throughout our city were asked to remember we were there and always glad to be of use to them and their wards. In this way our clinic was remarkably free from impostors, and I wish it could have continued, but as the Eye and Ear Infirmary desired our room we are now without a home. We are not able to maintain rooms for ourselves, and so perhaps this experiment is at an end. However I may feel in regard to other hospitals and infirmaries, I know this one was a remarkably pure clinic, and that a very small percentage of patients received were impostors. But then it was a very small clinic, and one that probably would not so easily attract the attention of impostors. Possibly—most likely, if it had been larger and wider reaching it would have had all the evils of the other clinics.

I wish I had time to tell you more about this clinic, but it is not my purpose to make that a part of this paper. Did I feel strongly that such an infirmary worked only for good, I would try to re-establish this dental clinic. With the doubts I hold and have here expressed, I hesitate. But Huxley says, "Society is stable when the wants of its members obtain as much satisfaction as, life being what it is, common sense and experience show may be reasonably expected," and I am not sure dental society in Portland is stable with this dental clinic out of existence.

If we do not consider dental infirmaries as the best means of doing our charity work, then it only remains for us individually to do that which we can to alleviate the sufferings of the poor. And I really think we can more carefully regulate our charity work, each at his own office, than it is done for us as a part of any hospital or infirmary as now managed. Again, we can without question at our office fix a fee, regulated by the necessity of the sufferer, and that is a very difficult thing to do at charitable institutions. Possibly we will be altogether much less imposed upon at our offices than at the infirmaries; but, on the other hand, we lose much if we lose the infirmaries, for it would be difficult to set apart certain definite hours in the week when you would receive charity patients. It would be annoying to have them coming in at any time, and you would not like to have the average charity patient in your reception-room together with your regular patients. I warn you charity patients are just as sensitive to slight as your most aristocratic patient.

I am not sure but that we should give them the same attention as our best patients receive, for it is a great question as to how far the fact of their being charity patients should be shown to them. We should not wish to take away their self-respect, and yet we ought to impress upon them some way that they are in a condition they must strive to rise above, a position in which it is not pleasant to remain.

I am afraid my paper is already too long, and I only hope I have suggested to you some of the benefits and disadvantages of the methods of doing dental charity work, and that you will all help to do something for the poor; for, believe me, there is a great need that they be taught how to care for their teeth and assisted in doing it by competent dentists.

Let me close with a quotation, that I may in my ending again

suggest to you that this paper is intended more as opening a discussion than as presenting ideas of mine known to be truths. Spencer says, "Hence it is not to be expected that modes of thinking on social affairs are to be in any considerable degree changed by whatever may be said respecting the social science and its difficulties. The only hope is that here and there one may be led, in calmer moments, to remember how largely his beliefs about public matters have been made for him by circumstances, and how probable it is that they are either untrue or but partially true."

"When he reflects on the doubtfulness of the evidence he generalizes; when he counts up the perverting sentiments fostered in him by education, country, class, party, creed, when observing those around, he sees that from other evidence selected to gratify sentiments partially unlike his own there result unlike views; he may occasionally recollect how largely mere accidents have determined his connections."

"Recollecting this, he may be induced to hold these notions not quite so strongly; may see the need of criticism of them with a view to revision, and, above all, may be somewhat less eager to act in pursuance of them."

AS WE SEE IT.

BY DR. G. ALDEN MILLS, NEW YORK.

IN the May number of the *Dental Cosmos* a liberal outlay of contributions on what some see fit to characterize as the hackneyed subject of "Rigge's disease," "pyorrhœa alveolaris," etc., Professor Harlan has reviewed much on this subject, and he has gone over the ground in a fairly liberal manner, as much so as most men do who have preconceived views. This review received due attention by several present at the reading. Too many think that, because we differ, it is always due to prejudice. Too often this may be so, but putting this aside, any one who is really intelligent regarding the subject cannot fail to find much that will be helpful to a more profitable consideration. It is thought quite possible, as remarked by Dr. Rhein, that, could all those that have well-digested thought in this direction come together to confer, it would be found that there would be more agreement than would appear.

It may be found that some speakers felt that the subject of treatment did not receive due attention, simply because it was not on the programme. It was the etiology which was under discussion. We must learn to take men's views with kindness, when we know them to be forceful writers, and read between the lines for the larger thought or meaning. Dentistry is a youthful profession as yet. The faith is strong that we will be able to develop our own needs. No one so well knows as the dental scientist what is required to strengthen our ranks. We are not behind any calling of prospective men that are not yet through with investigations, and by continued conferences, the exchange of views, and a courteous demeanor, solid, practical deductions will follow.

Turning to the paper which follows Professor Harlan's,—Dr. Henry S. Nash's on "Alveolar Necrosis,"—we go over it in its published form and account it as one of the most important papers, as a whole, that has ever been given upon the subject. This paper deals precisely with a feature that has been much emphasized by those familiar with practical experience, because of the utter inability of the mass of dentists to recognize the fine pathological expressions; hence the neglect to deal with the disorder at its initial manifestations. Very few practitioners have the ability by nature or by teaching to discern a surgical condition. This fact justifies the declaration that it does not come within the domain of the dentist, but in that of the surgeon, who may be a dentist. If one has not surgical talent, he cannot be a surgeon. The late Dr. Riggs often remarked that this matter would not become intelligently considered until it was plainly seen to be a field for surgery. We give an illustration that we have given before: The doctor was corresponded with concerning a patient who was to be sent to him by a dentist holding a medical degree; he informed the doctor that it was a case of "cleaning teeth;" the doctor's reply was that there was no need to send the patient to him for such an operation.

It is our belief that Dr. Nash has stated it truly that these initial symptoms appear and disappear according to the fluctuations of systemic conditions, but sooner or later cause death of the alveolus; and there is no doubt that in some cases a sequestrum is formed. We have had two marked cases of the process being separated around bicuspid. In this field, so prolific with death of the process, is the ground for the emphasis of the value of Dr. Riggs's discoveries, and which were given to the profession. All who know what he

taught, and have practised it, will recognize its true value. Many see only "tartar," and hence the wholesale neglect of these cases. They do not take them in hand with any thought that they have inability to comprehend a field of surgery which they know not how to deal with. This has long been apparent, and has often been expressed, and it is with satisfaction that one has appeared in the field who intelligently confirms the ground that the writer has so long stood upon. It has often been said in public and in private that the cause of such laxity of belief in a remediable practice was wholly because no effort was made to meet the demand that existed in this dead alveolus, because it was not recognized. Just here Dr. Riggs dealt, and by a surgical operation with the Riggs instruments, as he devised them, he removed this dead alveolus and made a simple wound, and nature came to the rescue. The letter published in the revised edition of Dr. Nash's book (prepared by the writer by his invitation) places decided emphasis upon this fact. It can be said, without fear of ever being intelligently disputed, that Dr. Nash's writings are giving us more intelligence than anything that has gone before. Nothing is hazarded in repeating what has often been said, that if practitioners did not recognize the facts pointed out, they would never contribute to the skilful management of this much-misunderstood disorder. By an intelligent discrimination in the initial phase of this alveolar disorder a vast amount of distress will be saved to our trusting clientele.

The writer desires to place himself on record with Dr. Nash concerning what he has said about Dr. Fraenkel's views that he classifies them as functional, arising from ataxic or disordered functioning of the sympathetic nervous system. It is firmly believed it will be so proved. I expressed myself decidedly but briefly regarding Dr. Talbot's late book, believing, as I did, I could see no ground for his conclusions on the low animal field that he was investigating. Sympathetic disorders in a human being lead us entirely into another realm of mental activity, which can have no bearing in the lower order of the animal kingdom. Those who indulge in evolution as dealing with mankind are led into a multiplicity of error. Man can choose his ground of belief, but some day it will be seen that he may have crossed the Croston's purposes, and this supposed light will be turned into utter darkness. This may seem a deviation and out of place, but I am of the decided belief that it is sadly needed.

Abstracts and Translations.

COCAINE AND ITS RATIONAL ANTIDOTE.¹

BY G. LENOX CURTIS, M.D., NEW YORK CITY.

IN the majority of cases in which cocaine is used some excitement either pleasant or unpleasant is manifested. The pulse becomes rapid, the breathing quick and deep, followed by headache, dryness of the throat, pallor of the face, nausea, and coldness of the extremities, accompanied by a tingling sensation; the skin becomes clammy, and often great beads of perspiration form; the eyes grow glassy and the pupils dilate. When a large amount of the drug has been ingested, convulsions, either tonic or clonic, may occur, or collapse may follow. Death is due to gradual cessation of respiration.

Cocaine is a stimulant to the central nervous system. It increases cerebral activity and endurance of fatigue. For generations the natives of Peru and Bolivia ate cocoa-leaves as a stimulant, and their soldiers were provided with them to chew when making forced marches. Scientific experiments prove that more work can be done after taking cocaine. The heart's action is accelerated by cocaine owing to the direct action of the drug on the cardiac muscle and stimulation of the cardiac sympathetic. Paralysis of the vagus, as in belladonna poisoning, cannot account for the increased activity, for stimulation of the vagus in a case of cocaine poisoning slows the heart, showing that the latter nerve has not been deprived of its function. At first the blood-vessels are much contracted, which, with the rapid pulse-rate, causes a marked rise in the blood-pressure. The cause of the arterial contraction is stimulation of the vasomotor centre. Subsequently the blood-pressure falls from peripheral vasomotor paralysis.

The local effect of the drug is due to paralysis of the termini of some of the afferent nerves, particularly those conveying impressions of pain and touch, but the temperature sense does not seem to be affected. Cocaine acts best on mucous membranes. In the

¹ Read before the Union Dental Meeting, Richmond, Va., May 10, 1900.

nose it paralyzes the sense of smell as well as sensation, but it has very little effect, if any, on the healthy skin. Schleich's method of infiltration anaesthesia is probably the most satisfactory. I have found that a weak solution of cocaine is especially applicable in work on the mucous membrane, but in operations on the deeper tissues, and in bone work, the stronger solution is more effective. I therefore use from a ten per cent. to a saturated solution. The great advantage gained by employing solutions of high strength is economy of time in the operation, which to a busy practitioner is important. In from one to two minutes after the injection the surgeon can proceed and the operation be completed by the time a weaker solution would have taken effect.

The most successful surgeons of to-day aim to consume the least possible time in operating, and thus lessen shock.

The opportunities for the use of cocaine are numerous. It is effective in major as well as in minor operations. If more operators would follow Schleich's example, much of the discomfort and danger of general anaesthesia would be averted. I predict that the time will come when ether and chloroform will be held in reserve as emergency drugs, and that cocaine, or some other local anaesthetic, will supersede them. I am able to do fully ninety per cent. of my work with cocaine. The principal objection to it is its toxic effect; if that can be overcome by an antidote, surgery will forge ahead and many major operations will become minor ones.

Cushing says, "Cocaine is a protoplasmic poison. It destroys the protoplasm of nerve-end organs, hence explains its local anaesthetic action. When a solution of cocaine comes in contact with other organs, it destroys their vitality. Ciliated epithelial cells, leucocytes, and spermatozoa become motionless. Cortical nerve-cells lose their excitability. Many of the invertebrates are killed by even a short exposure to cocaine. Movements of protoplasm in plants are also retarded or entirely suppressed by this poison." This doubtless accounts to a greater or less degree for the general languor that usually follows the use of cocaine. In continued daily operations where cocaine is employed the strength and energy of the patient decline, and often a morbid condition ensues.

A rational antidote cannot be expected to prevent protoplasmic poisoning or destruction. Operations are not usually done on the same patient every day, hence nature may be safely permitted to look out for local ill effects, which, in any case, are never without

A successful antidote must antagonize the paralyzant effect of cocaine upon the heart, the blood-vessels, respiration, etc. It should comprise in its physiological action the merits of digitalis or strophanthus, belladonna, ergot, calabar bean, etc. In its effect upon the circulation and respiration, volasem, which is an extract of violet, resembles the principal action of these drugs. Its effect is manifested so quickly and surely that with it any required strength and amount of cocaine can be safely used. Volasem neutralizes the general toxic effect of cocaine, but does not interfere with its local effect. It stimulates the heart's action and contracts the arterioles. It stimulates the respiration and raises the blood-pressure. When administered immediately before cocaine is employed, it prevents the usual untoward symptoms by maintaining the respiratory and cardiac functions. I have found that where volasem was administered in five-drop doses, every hour, until twelve doses had been taken, no appreciable action was observed; but when fifteen drops were given every half hour for two hours, its action upon the heart and lungs was similar to the primary effect of cocaine, but none of the other cocaine symptoms were observed. I have also noticed with susceptible patients that ten drops would produce similar results within a minute or two. These cases respond quickly to cardiac stimulants, and have none of the usual cocaine after-effects. I found, however, that hypodermic injection of cocaine would immediately restore the equilibrium. Thus I am led to believe that these two drugs antidote each other.

To show the efficacy of volasem, I will relate some clinical experiences.

Mrs. A., aged forty, upon whom I had previously operated under cocaine, was to be operated upon again, this time for the removal of a tumor. When ready, I discovered I had no volasem, but concluded to proceed under a four per cent. solution of cocaine. I injected four drops and waited for its effect. In about two minutes the patient showed unmistakable toxic symptoms. Aromatic spirits of ammonia was quickly administered, and by the time her clothing was loosened alarming symptoms appeared. The patient being unconscious, hypodermic injections of digitalis, whiskey, and strychnine were given. Most of the extreme symptoms were manifested. Respirations had fallen to seven a minute; the radial and temporal pulse ceased, and the heart's action was scarcely perceptible. It required an hour's hard work to restore the patient, and

it was several days before she was in a normal condition. Two weeks later I went on with the operation, first giving five drops of volasem and a minute later injecting thirty drops of a ten per cent. solution of cocaine into and about the tumor. I completed the operation in twenty minutes, the patient showing not the slightest effect of the cocaine. She expressed her astonishment at the virtue of the antidote.

Another phase of the toxic effect of cocaine and the quick action of volasem was recorded in my discussion of Dr. Foster's paper on cocaine poisoning, published in the *Dental Cosmos* for November, 1898. The patient was brought to me by his dentist on the eve of my summer vacation in 1898. As the case was urgent, I concluded to operate with the doctor's assistance. I prepared the volasem, but forgot to give it. I injected half a drachm of a saturated solution of cocaine. Within a few seconds the patient complained of a peculiar sensation pervading his entire body and a tingling in the extremities. He became unconscious, and was soon fighting like a demon. It was with great effort we prevented his doing us bodily harm, when suddenly toxic convulsions occurred. I turned to give him more volasem, when I discovered I had not given him any. Prying open the mouth, I poured the ten-drop dose down his throat. After the lapse of a minute the muscular rigidity relaxed, and within another minute restoration was complete. The patient stated he had no knowledge of what had happened. I finished the operation, and within an hour he went to his home, apparently none the worse for his experience.

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on Tuesday evening, April 3, 1900, at the office of Dr. George S. Allan, 51 West Thirty-seventh Street, New York, the President, Dr. E. A. Bogue, in the chair.

The minutes of the previous meeting were read and approved.

COMMUNICATIONS FROM OFFICERS.

Dr. S. E. Davenport.—It grieves me to be obliged to inform the Institute that our dear friend and member, Dr. George A. Maxfield, of Holyoke, Mass., whom we expected to enter largely into our programme this evening, is plunged into the deepest sorrow on account of the recent death of his only son, a lad about ten years of age. I think it would be fitting, Mr. President, for the members of this Institute to give an expression of their sympathy through our secretary to Dr. Maxfield. I move you, sir, that our secretary be instructed to communicate to Dr. Maxfield our sympathy for him in his bereavement.

Motion seconded and unanimously carried.

[The report from Dr. La Salle anent the International meeting at Paris simply covers the official notices already published, and is too late to be of value to those attending the International Dental Congress. It is therefore omitted.—ED.]

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. W. St. George Elliott.—I wish to present to the Institute a new form of sterilizer invented by my son. The apparatus consists of a cylindrical receptacle in which the instruments to be sterilized are placed. The whole is then covered with a hood, after which the apparatus is filled with formaldehyde gas. I can recommend it on account of its simplicity and the ease and quickness with which the desired purpose can be accomplished.

The second appliance is a simple automatic cut-off for gas to be operated by an ordinary alarm clock in shutting off the gas from the vulcanizer. The alarm being set for the time desired to shut off the gas, the rotation of the alarm-winding key releases a weight on the end of an extension piece attached to the gas tap, thus cutting off the gas.

This instrument is a broach-holder which is capable of holding a broach at any angle with the handle. It can also be used as an odontometer.

The President.—I have received a little communication from our friend and fellow-member, Dr. Barnes, of Cleveland. He has requested me to present to the Institute, with his compliments, an amalgam crown, together with a little paper descriptive of it.

DR. BARNES'S COMMUNICATION.

DEAR DOCTOR,—I have a new thing in the shape of an amalgam crown which I will send on. If you think it of sufficient merit, present it to the Institute.

Briefly, it is this: A sectional plaster model is taken of the crown of a natural molar tooth. Different models will give a selection of crowns, and they can be made in the laboratory by the assistant, and kept on hand for use at any time.

Quick-setting amalgam is then burnished to the sides of the model, leaving the centre hollow and a hole through the centre of the crown. When the amalgam has set it is polished, and you have a hollow amalgam crown which may be set upon a badly decayed root with quick-setting amalgam.

The root is prepared as for any large filling, with pins extending into the coronal portion; a crown is selected of the correct size and shape; a narrow band of phosphor bronze is placed about the cervical portion of the root, extending up to hold the crown in position. Prepare amalgam rather soft and pack into the root portion; the crown is then forced into position, being held in place by the band. The hole in the top of the crown permits of manipulation from above with instruments. When on a few minutes, the band may be removed and the excess of amalgam about the cervical portion removed in the usual manner. Those who have seen the crown here are quite well pleased with it.

Fraternally yours,

HENRY BARNES.

Dr. Barnes also called attention to a little clamp which he has found extremely useful and which is described in the March number of the *Dental Cosmos*, page 258.

Dr. Davenport.—I should like to say that the crown, upon examination, seems worthy of highest commendation wherever an amalgam crown could be used.

Dr. S. H. McNaughton.—I think it would be better if, instead of making the band of bronze, he would make it of platinum or gold and leave it in place permanently.

Dr. G. E. Adams.—With your kind permission, I would like to present to the Institute models of a case which was of great interest to me. It is the case of a boy fourteen years of age, who has no lower permanent teeth and but four teeth in the superior maxilla.

The boy was brought to my office by Dr. Watson, who prepared these models. His temporary teeth were extracted and no permanent teeth erupted. I do not know that it is new to most of the gentlemen present, but it is the first case of the kind which I have ever seen.

The President.—Such cases as this are not unknown, but we are greatly obliged to Dr. Adams for presenting the models to the Institute.

The paper of the evening, "Some Methods of extirpating Pulps, and Subsequent Treatment," by Dr. J. B. Locherty, was read.

(For Dr. Locherty's paper, see page 590.)

DISCUSSION.

The following letters were read by Dr. Davenport:

From Dr. E. C. Briggs, of Boston:

It is not my intention to present a finished article to the Institute of Stomatology, but only to jot down a few of my theories and practices in relation to the subject-matter of Dr. Locherty's paper. I strongly advocate the surgical removal of the pulp, because I feel that when it is successfully done the tooth is in no sense devitalized. In my opinion, the fully matured tooth is not dependent upon the pulp, while, on the other hand, the presence of the pulp is often a menace and cause of serious trouble,—as witness the nervous disturbances resulting from pulp-stones and exostoses,—and seriously complicating the treatment of pyorrhœa alveolaris; and if the pulp is removed surgically and aseptically, the tooth will be stronger and more serviceable than before. When surgically removed there is no injury to the pericementum or to the nerves running from the root-canals to the pericementum. In other words, the tooth's vital connection with the body is not disturbed; one has only removed the constructive organ, and, construction being complete, it becomes a superfluous tissue. Of course, to make a perfect result, asepsis and complete mechanical stopping of the canals must supplement the removal. The fact that there are failures to do one or both of these things, owing to faulty manipulations or malformations, does not militate against the underlying principle in the case.

On the other hand, it is my belief that the destruction of the pulp with arsenous acid is too often fraught with danger far-reaching in its results. The tooth too often becomes literally a

dead tooth, and too often the tissues beyond the tooth are affected, becoming the starting-point of abscesses, dentigerous cysts, and the like.

While I do not believe that arsenic is directly the cause of death, I do think that many cases, fatal and serious, may be due to actinomycosis, which finds its nidus in the necrotic tissue caused by arsenous acid.

But "necessity knows no law," and I, too, use arsenous acid when it seems necessary. It is my aim, however, in all cases to use it only in part, trying to get the pulp from the canals by surgical means before the arsenic has reached that point. Arsenic is a deadly and subtle poison, and the term caustic or escharotic is no description of its insidious and penetrating toxic action.

It was in January, 1892, that it first occurred to me to use cocaine in the surgical removal of the pulp, and I wish that all might share with me the great satisfaction this method gives. I use a twenty per cent. aqueous solution of the hydrochlorate, and with blunt-pointed syringe or plugs of unvulcanized rubber endeavor to throw the solution *around* the pulp, not into it. It is my theory that the cocaine solution jackets the pulp, since in all cases when, from too sharp or too small-pointed a syringe, the pulp has been penetrated, the result has been unsatisfactory.

The injection is begun slowly, so that the first pressure against the pulp shall not produce a shock; then, as the solution gradually forces itself around the pulp, the pressure becomes harder, until finally the piston is pressed down as hard as may be. If all has gone well, there has been no pain, and immediately one can bur out the pulp-chamber and with barbed broaches remove the pulp from the root-canals. The roots are then to be dried out and filled immediately. Waiting even half an hour, as I have done where an emergency case has had to be "sandwiched" in, will show that all life has not been taken from the tooth, as the passage of a broach into the root gives as much pain as if the pulp were still there.

The cases of surgical removal of the pulp by means of cocaine done in my office by myself and my four associates number in the hundreds, and the testimony of all is that it is one of the greatest comforts of modern dentistry.

I will not weary you with citation of cases, but state that they include the patients who come to you with toothache from exposed pulp, whether from disease or fracture, neuralgia from pulp-stones,

and the rare but necessary instances where teeth must be used as supports for bridges. Some cases of single-rooted teeth have been dismissed from the chair with the root filled within a half-hour from beginning the operation. There are some cases of failure, a small per cent., however, of the whole number treated. In these cases the cocaine has little or no effect. Why, I do not know. It may be non-susceptibility to the drug, or the pulp may be adherent to the walls, thereby not allowing the cocaine to get in around it.

The theories and observations contained in this paper are based entirely on clinical experience, and I am aware that the more scientific of you may pick flaws in it.

From Dr. H. W. Gillett, of Newport, R. I.:

Dating from the reading of a paper by Dr. E. C. Briggs before the Harvard Odontological Society, in about 1890, in which he advocated pulp extirpation with the aid of cocaine, I began following that procedure as regular routine practice, at first for selected cases, but soon for practically all cases.

For at least six or seven years, more than ninety-nine per cent. of all my pulp removals have been by that method, generally using the cocaine with a syringe, as Dr. Briggs does.

It is my habit to pump up ninety-five per cent. carbolic acid after removing the pulp, using fine jewellers' broaches or Donaldson cleansers, and, unless prevented by hemorrhage, to fill the canals at the same sitting. In my hands this procedure has resulted in the retention of good color in the pulpless teeth in all cases, and has been equally satisfactory in leading to practically universal good results as regards usefulness and comfort of the teeth so treated.

So far as I am able to trace them, the unsatisfactory results in several years of this practice are limited to one case of failure to get the tip of a lower molar pulp and consequent persistence of sensitiveness, and one case of abscess due to the disappearance of the salol root-filling in a tooth so treated.

It frequently happens that there is more or less soreness for a few days after the operation, this being often dependent (apparently) upon a tendency to go too far in the effort to make sure of all the pulp, or sometimes to forcing the cocaine solution too hard.

In my hands I have not found the procedure productive of more discomfort at the time in the average case than the older arsenic method, often the reverse, and I have found it so much more certain to result in a permanently useful and satisfactory-appearing

tooth that I regard it as an essential to the satisfactory practice of our profession. The practical certainty of freedom from objectionable discoloration with this process cannot be too strongly brought out, and I feel that it should be insisted upon as the only admissible method of practice for pulp extirpation in, at least, the ten anterior teeth.

For molars there may be room for difference of opinion, but as regards my own practice I adhere to it there also, in spite of the greater difficulties (with very rare exceptions), because of the better average condition of the teeth as compared with those in which arsenic has been used.

From Dr. B. Holly Smith, of Baltimore:

My views and my practice have been so fully set forth in the paper read before the National Association in 1888, in Omaha, also in the paper read before the Northeastern Dental Association at Holyoke, Mass., in the fall of 1899, that I feel that it would be only a multiplication of words to enter into a discussion of this subject, except to say that continued experience in doing away with the dental pulp, convinces me that, wherever it can be done, the surgical course should be pursued, using cocaine as the anæsthetic. Such a very large proportion of pulpless teeth in which arsenic has been used as the devitalizing agent have given trouble, as compared with the very small proportion of teeth made pulpless by the surgical method, that this is sufficient proof of the superiority of the latter method. I still adhere to the plan of electrical osmosis, or producing the first anæsthesia incident to the exposure with cocaine cataphorically applied.

I should like very much to be at the meeting, but my college work, together with the fact that I have already been out of the city a great deal, compels me to remain at home.

Dr. Adams.—The paper of the evening has been of great interest to me, as have the communications read by Dr. Davenport. In the practice of the surgical extirpation of the pulp my experience is quite limited. Unfortunately I seem to have met with a large number of patients who are very susceptible to the effects of cocaine, and for that reason I have not used it to any extent. My method has been to make a paste of arsenic, morphia, and menthol, which is sealed into the cavity with cement to prevent leakage. I find this effective, and have never seen ill effects from discoloration.

Dr. I. Franklin Wardwell.—My experience of late in devi-

talization has been very limited, indeed, and unfortunately being detained this evening, I did not hear the paper, consequently I am not prepared to discuss it. I have no doubt that for the anterior teeth the use of the cocaine for extirpation would work very satisfactorily. In this connection I am reminded of a preparation given me some years ago by my friend Dr. Forberg while I was in Stockholm. It was a peculiarly prepared cotton for filling root-canals, called "kopvadd," and when so prepared cannot be ignited. I remember filling the canals of a tooth with this preparation with success, the tooth, I was told, having a history of nineteen previous treatments and fillings, and each time the filling had to be removed.

Dr. E. H. Babcock.—I have been very much interested in the paper, although I am one of those who have used arsenous acid preparations almost exclusively. Regarding the dangers of injecting cocaine into a tooth, it has seemed to me that they would be very slight, as there would be very little chance for absorption through the apical foramen. The essayist spoke of using the aromatic sulphuric acid in cleansing pulp-canals. I would like to ask, Why use the aromatic in preference to the plain sulphuric acid? As I understand it, the action of the sulphuric acid is simply to dissolve the inorganic part of the tooth.

Regarding the matter of water in the tubuli for the more ready distribution of whatever medicament is used, my plan has always been to remove all fluids from the canal, thus allowing capillary action to carry the antiseptics thoroughly into the dentinal substance. As to my own method, I do not claim any pre-eminence of success, but I can say that it has given my patients and myself great satisfaction. I have always used arsenous acid combined with sulphate of morphia, oil of cloves, and sufficient creosote to make a paste. When I desire to devitalize a tooth, I take a piece of cotton about the size of the head of a pin, and after dipping it into ninety-five per cent. carbolic, I place upon it a few crystals of cocaine, which are readily dissolved in the carbolic. I then dip this into the paste and apply. The anæsthetic effect of the cocaine, lasting from three to five minutes, is supplemented by the action of the carbolic acid, and that, in turn, by the morphia. It has been my experience that the patient has no pain after the first few minutes. The only condition where I have trouble is where the pulp is partially dead. This is probably due to two causes: first, the con-

gested circulation, which prevents absorption, and, secondly, that there is considerable devitalized pulp to penetrate before the medication can reach the vital portion. These, I believe, are cases which would be particularly adapted for the use of cocaine. I do not believe in using a very large quantity of arsenic, nor in leaving it in longer than twenty-four hours (as a rule). After the first application of arsenic any remaining vitality can be overcome by the use of carbolic and the crystals of cocaine.

Regarding the matter of discoloration, I have never considered that the method of devitalization by the dentist had anything to do with it. It is a matter dependent entirely upon proper cleansing and filling of the tooth.

Dr. J. H. Downes.—I have listened to everything which has been said this evening with a great deal of interest, particularly regarding the destruction of the pulp. So far as my method is concerned, I use arsenic altogether. I never have tried the surgical operation, but, as I have never taken particular pains to protect the pulp from moisture, I probably should not have been successful. I have found that arsenic applied in small quantities successfully destroys the pulp with very little inconvenience to the patient, and I doubt very much if the surgical method could be accomplished without some pain. I think, myself, that I prefer the arsenic. Regarding discoloration, I believe that is independent of the method of devitalization, as it seems to occur in all dead teeth irrespective of the cause. There must be many cases where it would be impossible to perform the surgical extirpation, and again the long time taken for the operation should be taken into consideration.

Dr. C. O. Kimball.—I have listened to the paper with a great deal of interest, and as it is directly in line of my own practice, I may be permitted to say a few words on one or two points.

In the first place, my observations convince me that a tooth destroyed by arsenous acid does not discolor as much as a tooth which dies a natural death. As I look back over my cases this seems to be the invariable observation. My practice has, for a great many years, been to use arsenous acid for devitalization, but about the time Dr. Briggs spoke of using cocaine, eight or ten years ago. I began using it in my practice, not so much for aid in devitalizing the pulp as for obtunding the gum in the use of little retaining wedges. I now use it continually, and while at first I had a certain number of disagreeable cases, I have lately had almost none. I

will say this about the use of cocaine, that if used in the mouth in small quantities, not more than one-half to one minim of a two per cent. solution, being careful not to let the patient swallow any, it can be used without any difficulty whatever. I use it in all sorts of patients. I have recently been using eucaine, but I have found a larger number of cases followed by infection in the use of eucaine than with the use of cocaine. I am led to wonder if this is not due to the different action of the two drugs on the capillaries, eucaine relaxing, while cocaine has the opposite effect of contracting them.

As to the extraction of the pulp under cocaine, I can speak positively about that, as I have used it many times. For the anterior teeth, where there is a single root, it seems to me that it is far better than any other method. There is no question in my mind but that it can be done with almost no pain. Indeed, I have tried it many times with this result, questioning the patient very carefully in all cases. In cases difficult of access I prefer the arsenous acid method.

Dr. E. H. Raymond.—The paper is one of interest, and I regard it as a valuable contribution. In 1885 I made some extended experiments with cocaine, injecting the drug hypodermically into the inferior dental and mental foramina, for the lower teeth, and into the infra-orbital to anæsthetize the anterior superior teeth. It was found that good anæsthetic effect was produced in this way in some cases, but results were not uniformly successful, as in some temperaments it acted as a diffusive stimulant without producing anæsthetic effect.

Not being able to get uniform results with it for anæsthetizing and extirpating pulps, I abandoned its use. I have lately been using eucaine, as it seems to be more readily absorbed by the pulp-tissue.

As to arsenous acid, I think the trouble is, generally, that too much of the drug is used. A very minute quantity is all that is necessary to devitalize the pulp in any tooth, although the application may have to be repeated. Great care should always be used to seal it in the cavity tightly, as unfortunate results might follow if it comes in contact with the surrounding tissues.

When a pulp is found to be exposed in a cavity running some distance under the gum, and has become congested, what is the best means of making the application of arsenous acid to destroy it, and how would the surrounding tissues be protected?

Dr. A. R. Starr.—I can only say that I have had very little experience in the use of cocaine for the extirpation of the pulp. The only cases where I have used it have been in the anterior teeth, and here sometimes I have been successful and sometimes not. The great difficulty is the length of time required. It is unfortunate that our patients will come to us in a condition requiring extirpation of a pulp at times when we are very busy, and when it would be inconvenient to perform the operation under cocaine, although we can generally find time to apply some arsenic.

In the case just spoken of I have had the best success by using a little temporary stopping, first filling the cervical portion of the cavity with this and leaving the point of exposure uncovered. Then apply the arsenical preparation under a metal cap, and fill the remainder of the cavity with temporary stopping.

Dr. B. F. Luckey.—It does not seem to me necessary to go very deeply into this subject. The subject of arsenic, its use and abuse, is so old, it seems almost elementary. Regarding the use of cocaine and eucaïne in the extirpation of pulps, after a careful and conscientious use of these drugs I have gone back to my first love, arsenic. What I am unable to accomplish with arsenic I cannot accomplish with cocaine, except for rapid extirpation, and here I find the chloride of ethyl serves my purpose better. By covering the tooth with bibulous paper, and by using an alternating current, I might say, of the ethyl chloride, I am able to chill the tooth in such a way as to render the extraction of the pulp almost painless.

Where the cavity is so far under the gum as to render it difficult to apply the arsenic, my practice has been to drill in from the crown and devitalize the tooth in this manner. It is not necessary to go too far the first time. Drill as far as possible and apply the arsenic for a day or two, and then drill a little farther. In this manner it can be accomplished without trouble. The idea that it is absolutely necessary to place the arsenic in the cavity of decay is a mistake. I have fresh in my mind a case of a suit for damages for five thousand dollars. The cavity was on the labial surface of an upper cuspid tooth extending under the gum. Arsenic was used in a very slovenly manner, with a covering of cotton and sandarac varnish. As a result the patient not only lost that tooth, but the first bicuspid as well, and a large portion of the superior maxilla, from necrosis. If that dentist had either followed Dr. Starr's

method or had drilled into the tooth from another point, he would have saved his patient and his money.

Dr. De Witt L. Parker.—I would like to say that my brother and I have had some success in the use of compressed air for immediate extirpation of the pulp.

Dr. E. S. Robinson.—My method of procedure is generally the use of arsenous acid, though I have several times painlessly extirpated the pulp by means of cocaine. I have done this in teeth that have been broken off. I injected the cocaine by means of a hypodermic syringe, with a bent needle, but did not use the rubber dam. In speaking of discoloration, I think a great many times the discoloration is the result of the medicaments used in subsequent treatment. I find that oil of cinnamon causes a yellowish color.

Dr. J. G. Palmer.—One of our associate members, Dr. J. A. Libbey, of Pittsburg, Pa., suggested, in writing to me on this subject, the use of formaldehyde with cocaine. He claimed that it materially hastened anæsthesia. I have used it in only one instance, when I desired to remove the pulp at once. A boy about eleven years old was brought to me with a fractured right superior central, the pulp protruding. The accident had occurred twenty-four hours before, and, as we all know, the child was suffering a great deal of pain. I put on the rubber dam, and applied cocaine and formaldehyde in small quantities, removing the pulp in less than half an hour absolutely without pain.

Referring to cases when a buccal cavity extending under the gum presents, with an exposure of the pulp, as spoken of by Dr. Raymond, it would seem wiser perhaps to combine the two methods instead of immediately applying arsenic and risking the possible sloughing of the gum-tissue. By the use of cocaine, a sufficient quantity of the pulp-tissue can be removed to permit placing the arsenical application within the pulp-chamber, where it can be sealed.

Dr. L. C. Leroy.—I have been very much interested in the paper, especially in that portion touching upon the toxic effects of the arsenic being allayed by the use of the perchloride of iron, having had two or three troublesome cases. In one, occurring in the mouth of a brother dentist, where extreme caution had been exercised, it was impossible for the drug to have exuded except through the tubuli, possibly where the dentine, cementum, and enamel approximate, and this I feel convinced it did. The disturbance was

allayed by the use of the perchloride of iron. In another case, inflammation became quite extensive, even extending to the next tooth. Perchloride of iron was injected hypodermically. The change in twenty-four hours was remarkable.

Dr. Locherty's paper is of especial value because he outlines treatment for such conditions, which is the first instance to my knowledge such has been done. I gained my information for the treatment of arsenical poisoning from a medical book treating of poisons and their antidotes, after having searched in vain through dental text-books and a host of dental periodical literature.

As Dr. Starr has said, one objection to the cocaine method for devitalizing pulps is that patients requiring such treatment come to us at an inconvenient time. The use of the arsenous acid gives us almost universally good results. I have yet to record a case where I have lost a tooth by its use. In the use of cocaine, what becomes of the vital tissue which must necessarily be left in the canal? Does it retain its vitality, or does it subsequently become devitalized? As to the hemorrhage after the use of cocaine, this is controlled very easily by the use of the peroxide of hydrogen.

Dr. F. Milton Smith.—After listening to the paper, I congratulated myself that I had learned the secret of successful devitalization of the pulp, and was going home to-morrow to try it on a young man. Then I listened to Dr. Downes, who told us that if we take arsenic and apply it in the right way we will not have any trouble. I have been using arsenic ever since a professor in operative dentistry told me a number of years ago that I must never use it under any condition. I have not found it entirely satisfactory, as so many gentlemen have. I have heard a few gentlemen speak to-night of having no pain following its use. Unfortunately many patients in my vicinity have pulps which do not respond favorably to the application of arsenic, and I have lost teeth from the excessive pain caused by it. I find I am the only one who ever has this difficulty. However, I am inclined to try Dr. Locherty's plan, as I have failed so badly with my own for the last twenty-five years. I remember some months ago having heard the President of the Institute make some remarks in reference to the difficulty of removing the pulps from hair-like canals in molars. The question comes to my mind whether Dr. Locherty is able to remove these pulps in all cases. Dr. Wardwell has suggested the use of kopivaid. I am very glad to know that we have such an agent, but am in-

clined to think that Wardwell had as much to do with the cure of that case as the kopvadd. A lady came into my office to-day with a lateral incisor which has been treated for a year and a half. I shall treat the same with a little Smith, some carbolic acid, iodoform, and gutta-percha, and hope in less than a week to see it well.

Dr. Locherty.—I have been very much interested in the remarks of the different gentlemen present in regard to the treatment of the pulp, for and against arsenic, and it bears out my statement that there is a great diversity of opinion in this regard, and probably will be for some time to come. I used arsenic for a number of years, and then determined to try the cocaine method. I used it with varied success for a time and then went back to the arsenous acid. I then had a patient who was taken sick and unable to return to the office at the appointed time, and for that reason I abandoned the use of it altogether and commenced the devitalization and extirpation of pulps by the use of cocaine. I have continued to use it ever since, and find that I can accomplish just as thorough and more satisfactory results. So far as pain is concerned, the operation can be performed painlessly, provided sufficient time be taken. I will admit that it does take time, but the operation is such an important one that I believe the time spent is just as important and should be paid for the same as time spent in filling with gold, or any other skilful operation. I have found that cocaine has been more effective than eucaïne, although my experience with the latter might have been too limited. Ethyl chloride I have never used. It seems to me that cold applied to the root of a tooth might cause sloughing if applied too long. As regards the preparation of iron to use to counteract the arsenic, the oxide is the best according to chemistry. To check a hemorrhage when extirpating a pulp under cocaine, peroxide of hydrogen is very effective. As cocaine has the characteristic of contracting the capillaries, there is very little hemorrhage generally in using such a method, for instance, as described in the typical cases in the paper.

The President.—On this subject, "Some Methods of extirpating Pulps and Subsequent Treatment," it seems that we have heard of various methods. There are a few points that it might be well to recall. One is the question asked by Dr. Raymond regarding the use of arsenic in a cavity that was partially covered by gum. A few years ago Dr. Thomas, of Madrid, mixed cotton with arsenic, cloves, morphia, and oil of cinnamon, cut his cotton up in suffi-

ciently fine pieces that a little bit could be taken and put anywhere and covered with gutta-percha and wax. This cannot cease. It is one way of accomplishing Dr. Raymond's purpose, and I find it very satisfactory.

In all of the papers brought before us this evening, I have had a feeling that the gentlemen presenting them were not careful enough to discriminate. There are thirty-two teeth in the mouth with as many different characteristics as there are teeth. While it might be very easy to remove the pulp in the manner referred to in the six front teeth, it seems to me that it would be very difficult to remove it in this manner in some of the molar roots. I am sorry that Dr. Locherty did not bring that before us a little more clearly. I think I may venture to say that the fact that extreme heat and extreme cold are both anæsthetic was not brought out as sharply as it might have been. I have taken out pulp after pulp by this method; this in the six front teeth. The most notable one was the case of a gentleman who was not in the chair over twenty minutes. I enveloped the tooth in cotton and threw chloride of ethyl upon it; then removed the pulp and filled the root cavity. I remember the case of a little patient I had in the chair with an exposed pulp in a central incisor. I told him to hold on tightly, as I was going to hurt him badly. I had a smooth broach, the point of which had been turned at right angles, making a hook. I dipped this in creosote only and passed it up gently along the side of the pulp. When I had passed it up as far as I thought it ought to go, I rotated it gently with my fingers, and out came the pulp. It did not hurt much. The inference to be drawn from this is that the healthy, living pulp is not such a very sensitive thing.

When cataphoresis came along, we very soon were told that pulps were of little value; that they had performed their functions in the adult tooth, and could be extracted with ease and without injurious effects. Strange as it may seem, a crown-and-bridge man one evening at the Odontological was the only man to champion the unfortunate tooth-pulp. The question here arises, When is the function of the pulp ended? I remember the case of a gentleman who had worn his teeth to the gums by abrasion. A set of teeth was made for him covering these teeth. I do not know when the function of the pulp ended in this case, as secondary dentine was formed as fast as the abrasion took place. This gentleman was about sixty years of age.

Regarding the length of time arsenic can be left in a cavity, I think it has been stated by Dr. Westcott that he has left a treatment of arsenic in for several months without trouble, and it has been said to have been left in as long as three years. I think the fact has been pretty well established that as long as any arsenic remains there is preservation from putrefactive decomposition. Arsenical preparations are used in the preservation of the skins of beasts and birds. The gentleman whose patient returned with the treatment of long standing stated that he found the pulp in a "browned" condition.

I wanted, in connection with the surgical removal of the pulp, to call the attention of the reader of the paper to the many peculiarities in the shapes and sizes of the pulps, such as the lily-shaped canals. My son, Dr. Frederick Bogue, had occasion, the other day, to examine a bicuspid tooth in which a gentleman on the other side of the water had, as he supposed, extracted the pulp and filled the canal. The patient came in with an abscess. Upon removing the filling, a small hole was found where the pulp ought to be, with plenty of pulp on either side. As a result, the tooth had badly discolored. I think these are cases which the gentlemen advocating the surgical removal of the pulp do not always bear in mind.

Dr. Locherty.—Probably, in the cases mentioned by the President, it would be impossible to get out all the pulp by any method. We can only do our best.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

Editorial.

THE PRESENT AND FUTURE OF STATE BOARDS.

It may seem to some impolitic to reopen a controversy with the organizations known by the name of State Boards of Dental Examiners, and this certainly would be unwise had there ever been a permanent peace established between the colleges and these political overseeing bodies. This, however, has never been the case; the quiet

of the hour is that false quiet that precedes a more violent volcanic eruption.

The Boards have all had their usual spring examinations, and a certain per cent. of applicants have been rejected after having passed the various examinations of the college faculties.

To the average laymen this means a wholesome protection to the public and a renewed assurance of the value of this supervisory care in preventing unqualified men from entering the professional ranks. To the educators behind the examined students, it means simply that these students have succeeded or failed to answer a sufficient number of ten or a dozen questions in each branch. The success does not secure the dear public from the imposition of inefficiency, nor does it prove that the rejected are incapable of rendering good practical service.

The reason for this is obvious to the educator, but may not be equally clear to the man who looks solely upon the surface of things. The list of ten questions before alluded to may cover each of the subjects of anatomy, physiology, chemistry, materia medica, pathology, therapeutics, bacteriology, metallurgy, histology, oral surgery, mechanical and operative dentistry. It is equally clear that if a man should fail before the State board on anatomy and physiology, materia medica, or chemistry, it would so reduce his average that he would be rejected, although his standing in the other branches, especially the practical, might place him in the front rank in those qualifications that would enable him to render good service to suffering humanity. This does not seem to be considered by the examiners in their final decisions, and the young man is cast out, having spent his three years and earned his diploma in vain. The responsibility of thus wrecking a life may be appreciated by some of the boards of examiners, but it is feared there is a certain degree of satisfaction felt by others that they can thus show their great superiority to the colleges that trained these young men.

Superiority is a word of indefinite meaning. If, in their case, it is understood as a legal power given by the State Legislatures to do as they please, and ride rough-shod over the work of the colleges, then there will be no one to dispute the claim; but if it means that the average board is made up of elements of superior ability to the faculties of colleges, then there must be a decided dissent. Were it not that college men feel the seriousness of this whole train-

ness of re-examinations, the matter would be a subject for amusement.

The questions usually asked bear only a remote relation to the several subjects as practically taught. This could not be avoided when the source of most of these is understood. Quiz compends and ancient first editions of Harris's "Principles and Practice" are not exactly the best mines out of which to dig modern thoughts and modern science. It is not to be understood that this is applicable to all members of examining boards. Many of these are known to be cultured men, anxious to do the right thing in the right way. These, however, are handicapped by their lack of knowledge of what a modern dental college education means. They, as a rule, have never held close relation with professional pedagogical work, and therefore are, and have always been, out of touch with that knowledge which can only be received through intimate relations with student life and students' work. The questions given in these re-examinations lack life. They are apt to be general in character, striking, as it were, at the periphery of a subject rather than seeking the innermost central idea. The untrained examiner invariably seeks a question that when answered means nothing of real value, and which fails to determine the knowledge of the individual, but it gives a certain degree of satisfaction to the examiner, as it magnifies his self-consciousness of power.

The question of greater importance to the public, were it properly appreciated, would be, Do these re-examinations protect the people? As the boards are at present constituted, the answer must be in the negative. They not only do not protect, but experience has demonstrated that they are a menace to the very people they are supposed to serve.

It is difficult in the very best conducted schools, whether of dentistry or medicine, to prevent the man who will make a failure in practice from graduating. It is within the experience of every teacher that the brilliant mind will grasp all the subjects taught readily, but will fail in manipulative dexterity. On final examinations such a man will carry all before him in branches that require pure mental effort, while in the practical his work will fall below the average. What is to prevent such a man graduating either through a faculty or a board of examiners? This, however, is a trifling matter, for such a man, while not capable of doing much

good, especially in dentistry, will not probably do much harm, for the public will soon take his measure and avoid him. The other man, with mind sluggish and perhaps untrained to study, will find it impossible to meet the requirements of the faculty, and should he pass this difficulty, will suffer wreck in the re-examination, and yet he may be brilliant in those things that serve the public best.

Before the boards were instituted dentistry flourished, and the public decided for itself that which was good or bad. There was not then a far-off cry of this public demanding that it should be protected. The cry came from within the ranks. It was not the people, but the dental profession, that needed protection. Somebody must be given power to stop the flood of dentists pouring over the country. What was the result? With great difficulty legislatures were influenced to pass laws regulating dentistry. Governors were empowered to appoint boards of examiners. Men were selected, good, bad, and indifferent, and the great reform began. It was prophesied that soon the quack would be run to earth, soon dental colleges would be forced to do as the boards might suggest, or go to the wall. Soon the number of graduates would be lessened, and soon the standard of the dental profession would be raised.

A quarter of a century has passed since the influence of State boards began to be seriously felt, and this constitutes a sufficient period to measure results. Twenty-five years ago there were a few cases in all large cities where men sought to secure practice by unethical methods, but these were so few, and, while annoying from a professional stand-point, they occasioned no marked deleterious influence. The result now, after this long period of law, is that the "Dental Parlor" is duplicated and reduplicated in every large city, and even in smaller towns where it previously had no existence. It may be said that this has no direct bearing on the laws; that this would have been the result had no laws governing dentistry been placed upon the statute-books. This is possibly true, but the laws have been a complete failure in the suppression of these, even in the one State that fully enforces its law. The graduates, instead of being fewer in number, have been enormously increased until even educators have become anxious as to the final result. To meet this and to make more thorough men, the standard of entrance has been raised in all the colleges of the country. The curriculum has been advanced and the time lengthened until it

would seem impossible to go farther in this direction, and yet a still further increase in years is now demanded. For all these changes the boards take to themselves special credit. It is safe to assert that they had nothing to do with any advance. This came from within, and not from without, and would have been found necessary had the boards never been established. This is the status at present. The students are made to suffer, and the dental profession has gained nothing through this so-called supervisory power.

The fact that the State laws governing dentistry are not enforced to any appreciable extent is patent to every observer. It is possible, in some of the States possessing stringent laws, for a man to practise in spite of the boards, and this has frequently been done. The answer the boards make to this is, "We are not appointed for police work, and fulfil our duty when we have examined the students." This is true, and the enforcement of the law then devolves on others. The State officials whose duty it is take no interest in it, and will do nothing unless cases are brought directly to their notice, with proper evidence sufficient to secure conviction. The State societies have appointed committees, but they have failed to produce satisfactory results. The duty is disagreeable, and means large expenditure of money and time, and a certain loss of reputation. The result is that the law is not enforced. It would be perfectly easy in the State in which the writer lives for a man to practise dentistry without even a college training, and some have boldly declared they would practise in spite of the decision of the board. This is unquestionably a bad state of things, but it is not only the case, but there seems no prospect of any improvement. Better no law than its constant violation. New York is probably the only State where it would be dangerous to practise without authority. This is mainly due to one man. When he retires, it may not be possible to find another equally willing to assume the thankless task.

The future of these boards is a problem that will require the combined wisdom of all thinking minds. It is too late to expect these to be dispensed with. The laws will remain, and we must continue to have these bodies to deal with for many years to come. The question that interests us now is, Can there be any change made in the selection of those who will constitute these boards in the future?

It is no new thought that the men appointed on boards of examiners should themselves be forced to undergo an examination. To effect this has been deemed an impossibility, but it has never seemed to the writer a difficult problem. That the men to examine should themselves be examined requires no argument. The present method of selecting members of these boards is defective, even where the greatest care is taken by State societies, but those made exclusively by governors do not deserve a moment's consideration. They are intrinsically worthless, no matter how individually constituted. There seems to be but one way out of this difficulty, and that is to have all the laws so amended that State societies shall have the selection of a certain number, and from this list the governor to make selection. This is the present method adopted in several of the States. The writer would suggest a still further advance. Let the State societies amend the code of rules, so as to require all candidates for the State board of examiners to undergo an examination before being appointed. To meet this an examination board should be provided, to consist of a certain number of men taken from the college or colleges in the State where these exist, to make the necessary examinations into the fitness of the candidates for the work required. This would demand no change in existing laws. It will be said, You would never secure a board under such a rule. This would be true of the older men. It is well understood that they could not pass the simplest examination in the subjects previously named; indeed, their own questions would be a stumbling-block outside of their own specially prepared subject. There is, however, a large number of young men fresh from the more modern teaching of the schools who could and would submit themselves to such a board. There would be honor, as well as pecuniary inducement, for these younger men to make the effort. If such a plan succeeded, it would be a great advance over anything we have at present, although it is not contended that even this would make an ideal board. The board should then be supplemented by a salaried official whose duty it should be to hunt up cases and the evidence, and this man should not be a dentist in practice.

Something of the kind outlined here will have to be done if the future of the boards is to be anything more than a byword and reproach. At present they mean nothing but a worry, and oftentimes an injustice to the student and a continued aggression to

the teacher. The present arrangement is a crude effort that will not and ought not to stand the test of time, and the earlier the intelligent men connected with dental work and its progress take this seriously in hand, the better it will be for the future of the dental profession, in which all are interested and desirous of serving, that in the end it may advance beyond the criticism of the most exacting.

Obituary.

E. HENRY NEALL, D.D.S.

ON Sunday morning, July 8, there died one of Philadelphia's well-known dentists, Dr. E. Henry Neall, in the sixty-third year of his age, at his late residence, 114 East Washington Lane, Germantown.

Dr. Neall studied the art of dentistry in the office of his father, Dr. Elijah M. Neall, a pioneer in the profession. His specialty was the carving and baking of block teeth, and he was recognized as an expert along that line. As late as 1899 he gave demonstrations in that difficult dental branch before the students of the Medico-Chirurgical College.

Practising long before a college diploma was thought necessary, Dr. Neall, nevertheless, recognizing the advantage of possessing the same, matriculated in the Pennsylvania College of Dental Surgery, from which he graduated in 1868.

Many little devices and labor-saving tools, in connection with his beloved profession, can be traced to his ingenuity and fertile brain. He was ever active in dental society work, and was a member of the old Pennsylvania Society, the Odontological Society, and the Pennsylvania State Dental Society. Besides this, he gave of his services at frequent intervals to the dental students, being upon the clinical staff of both the University of Pennsylvania and the Medico-Chirurgical College.

Dr. Neall was a Christian gentleman in the fullest sense of the word. He was a member of Calvary P. E. Church, Germantown, and an earnest worker in the Brotherhood of St. Andrew.

During the war he went to the front with the Christian Commission to relieve the sick and suffering soldiers.

Dr. Neall was twice married, his first wife being Miss Elizabeth Enyard Montgomery, of Philadelphia; his second wife, formerly Miss Emily L. White, also of Philadelphia, survives him.

He leaves six children by his first wife,—Dr. Walter H. Neall, Mrs. W. K. Matsinger, Robert M. Neall, Mrs. Charles J. Pilling, Benjamin T. Neall, and Miss Edith Neall.

RESOLUTIONS OF RESPECT TO DR. THEODORE MENGES.

WHEREAS, God in His infinite wisdom has removed from our midst, and from the work in which he was becoming so great a force, our friend and teacher, Dr. Theodore Menges; and

WHEREAS, We, the students of Northwestern University Dental School, realizing the great loss that is sustained thereby; be it

Resolved, That we bow in humble submission to the will of Almighty God, and hereby express our heartfelt sympathy to the bereaved wife and sorrowing friends, and to the faculty of Northwestern University Dental School, of which he was a valued and honored member; and be it

Resolved, That, each one having lost a personal friend, we express our appreciation of his untiring efforts and devotion to the upbuilding of the dental profession at large, to the Northwestern University Dental School, and to the individual interests of its students; and be it further

Resolved, That a copy of these resolutions be presented to Mrs. Alice Menges, to the faculty of said institution, and that copies be sent to the leading dental journals for publication.

ELMORE T. HILL.

WM. A. KAARE.

L. J. SCHNEIDER.

EUGENE MAGINNIS.

CHICAGO, June 2, 1900.

Domestic Correspondence.

THE NEW METHOD OF INDUCING SLEEP WITHOUT DRUGS.—ONE HUNDRED DOLLAR PRIZE.

TO THE EDITOR:

SIR,—The new method of inducing sleep without drugs consists in bringing under will-power the functions of organic life immediately on retiring. The organs of respiration and circulation respond to our bidding. Certain other groups of muscle, by contraction and relaxation, are made accessory in directing the arterial and vital currents away from the gray matter of the brain. As a result, automatic thinking, which is the immediate cause of sleep's delay in the case of the average brain-working business man, is absolutely shut out, and normal sleep is inevitable.

To give the technique in full would require more space than can be given here. Suffice it, that mental and physical conditions, positions, and changes, extemporized and controlled by will-power in the horizontal position, with suitable temperature and ventilation of body-surface as well as lungs, is the sheet-anchor of "The New Method."

Believing that the medical profession has power to turn the attention of suffering humanity from the mysterious chimerical and damaging drug agents they now depend upon, and that it is our duty to shed light rather than darkness, I offer a prize of one hundred dollars for an essay which shall describe any method of extemporizing sleep immediately on retiring for the brain-working classes, that will equal or surpass the "New Method" above referred to.

Time allotted for preparing essays, from June to December of the present year. Length of essay not to exceed five thousand words; to be in print or type-written, without the name of the writer. Judges of the merits of essays shall be representative men of scientific medicine. Time for awarding prize, January 1, 1901. Results will be announced in this journal.

J. B. LEARNED.

NORTHAMPTON, MASS.

Notes and Comments.¹

THE DENTAL PROTECTIVE ASSOCIATION.—From letters and circulars sent out and published in the journals, the idea has become almost universal that the doors of the Protective Association were closed and no one could join that body hereafter. Regarding this, Dr. Crouse, in *Dental Digest*, says, "Nothing could be farther from our plans. *The doors were closed only for defence against suits on the present bridge patents*, and this action has no bearing on the Association taking in new members and guaranteeing to protect them against the abuse of other illegal patent companies."

COMMENTS ON THE SECOND APPLICATION OF ARSENIC FOR DEVITALIZATION OF PULP.—No. 1. A second application of arsenic is a great mistake. If the tissue within the pulp-chamber is found devitalized, there is no question concerning that within the root-canals. The sensitive point encountered at the apex is not vital pulp-tissue, but is due to an inflamed, irritable condition of the corpuscles of the cementum, from too large an amount of the arsenic left too long in the tooth, and requires the application of dialyzed iron to neutralize the arsenic, followed by soothing anodynes.—W. C. BARRETT, in *Dental Brief*.

No. 2. The above vicious paragraph, having appeared in several publications, needs correction. It is equivalent to saying that destruction of the particle means death of the man, or that an eschar on the finger is loss of vitality in the arm. It would be somewhat curious to note the mental aberration by which a man arrives at the conclusion that a breach in a nerve-canal, surrounded by dentine, irritates a corpuscle in the cementum, and especially how that cement corpuscle, devoid of nerve-structure, responds with such suddenness to a prick in nerve-tissue not at all connected with it.—CHARLES L. HUNGERFORD, in *Western Dental Journal*.

¹ The assistant editor solicits contributions for this department—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address THE WESTERN NEWS, Philadelphia.

A REMARKABLE REFLEX.—I was called at one A.M. to see a young man twenty-four years old, who, the message said, was dying. When I reached the house, he was trying to lie on a couch, had a flushed face and congested eyes, perspiring profusely, unable to remain in any position for more than a minute at a time, short spasmodic attempts to breathe, and complaining solely of constricted pain over the heart, over which he kept his hand constantly. Could obtain no history of the case from him, but from family learned that he had been taken very suddenly, in the manner above described, about two hours before. Had had toothache in lower left molar for about a week, and had used camphor freely to put on gum, and more freely than usual just before attack came on.

Gave him aconite every fifteen minutes, and within one hour he was resting quietly. Saw him the following two days, feeling quite well with the exception of some toothache, but with no more chest pain. Was called again the second night, and found him worse than the first time. I again gave him aconite, which seemed to give a slight relief, but finally was compelled to give him an opiate, as it took two men to restrain him in bed.

I now knew that the trouble must come from his tooth, for when his tooth ached he had no other pains, and when he had chest pain his tooth felt easy. The next day I took a dentist with me, who pulled the tooth, which was an unusual one, having exostosed roots, that had extended quite deeply into the bone. His recovery was rapid after the extraction.

I give this as an unusual case of reflex pain, and with the hope that it may show that reflex pains are more frequent than we imagine.—CHARLES B. KERN, M.D., in *Medical Visitor*.

The editor of the *Dominion Dental Journal* says of the above report, "It is a choice sample of medical ignorance of dental subjects. The 'Remarkable Reflex' was a simple case which the average dental student would have diagnosed and treated directly, without any of the preliminary humbug which the wiseacre had to use before he made the remarkable discovery that it was toothache."

DENTAL SURGEONS OF ONTARIO Current News.

HARVARD DENTAL ALUMNI ASSOCIATION.

THE Harvard Dental Alumni Association held its Fourth Alumni Day at the school building in Boston, on Monday, June 25, 1900, one hundred and fifty-one persons, aside from patients, being present.

Clinics and demonstrations were given by graduates, and the work of the three classes for the year shown, with many patients present. Essays by four of the professors and instructors were given.

The twenty-ninth annual banquet was held as usual at Young's Hotel in the evening, with one hundred and seven members and guests seated around the festive board.

Mr. Brooker T. Washington, of the Tuskegee Normal and Industrial Institute, Alabama, was the principal speaker, other speakers being Dean Eugene W. Smith, Boston; Mr. Roscoe Cushing Bruce, of Mississippi; Professor Thomas Fillebrown and Dr. L. D. Shepard, of Boston; and Charles W. Rodgers, of the Class of 1900.

The following were elected officers for the ensuing year: Cecil P. Wilson, '72, Boston, President; Henry W. Gillett, '85, Newport, R. I., Vice-President; Waldo E. Boardman, '86, Boston, Secretary; Harry S. Parsons, '92, Boston, Treasurer.

Executive Committee.—Waldo E. Boardman, '86; William P. Cooke, '81; Patrick W. Moriarty, '89.

WALDO E. BOARDMAN,

Secretary.

Boston, July 2, 1900.

NEW DENTAL SOCIETY.

THE dentists of South Jersey have organized a dental society, with head-quarters in Camden, N. J. It is called the Southern Dental Society of New Jersey.

Monthly meetings are held in the Masonic Temple Building, the third Wednesday evening of each month excepting July and August. The membership numbers twenty-three, and the sessions give unmistakable evidences of the interesting character and virility of the new society. The President is Dr. J. E. Duffield, of Camden; Vice-President, Dr. O. E. Peck, of Bridgeton; Recording Secretary, Dr. A. K. Wood, of Camden; Corresponding Secretary, Dr. W. W. Crate, of Camden; Treasurer, Dr. Mary A. Morrison, of Salem.

Executive Committee.—Dr. A. Irwin, Chairman, of Camden; Dr. J. G. Halsey, of Swedesboro; Drs. C. H. Tuttle, E. E. Bower, and A. B. Dewees, of Camden; Dr. J. H. Lummis, of Bridgeton.

NATIONAL DENTAL ASSOCIATION.

FOLLOWING are the officers of the National Dental Association for the ensuing year: President, G. V. Black, Chicago; Vice-President, West, T. W. Brophy, Chicago; Vice-President, East, E. S. Gaylord, New Haven; Vice-President, South, M. F. Finley, Washington, D. C.; Recording Secretary, A. H. Peck, 92 State Street, Chicago; Corresponding Secretary, Mary E. Gallup, 711 Boylston Street, Boston, Mass.; Treasurer, Henry W. Morgan, Nashville, Tenn.

Executive Committee (term expires 1903).—C. N. Johnson, Chicago; V. H. Jackson, New York; T. P. Hinman, Atlanta, Ga.

Executive Council.—H. J. Burkhart, Batavia, N. Y.; J. Y. Crawford, Nashville, Tenn.; B. Holly Smith, Baltimore, Md.; W. E. Griswold, Denver, Col.; Thomas Fillebrown, Boston, Mass.

A. H. PECK,

Secretary.

VERMONT BOARD OF DENTAL EXAMINERS.

A MEETING of the Vermont Board of Dental Examiners will be held at the Pavilion Hotel, Montpelier, Wednesday, October 10, at two o'clock P.M., for the examination of candidates to practise dentistry.

The examinations will be in writing, and include anatomy, physiology, histology, bacteriology, chemistry, metallurgy, pathology, therapeutics, surgery, materia medica, anaesthesia, operative and prosthetic dentistry, together with an operation in the mouth.

Candidates must come prepared with instruments, rubber dam, and gold.

Applications, together with the fee, ten dollars, must be filed with the Secretary on or before October 1.

GEORGE F. CHENEY,
Secretary.

ST. JOHNSBURY.

MISSOURI STATE DENTAL ASSOCIATION.

THE Missouri State Dental Association, at their thirty-sixth annual meeting, elected the following officers for the ensuing year: President, F. F. Fletcher, St. Louis; First Vice-President, W. M. Carter, Sedalia; Second Vice-President, F. H. Achelpohr, St. Charles; Corresponding Secretary, B. L. Thorpe, St. Louis; Recording Secretary, H. H. Sullivan, Kansas City; Treasurer, J. T. Fry, Moberly.

Executive Committee.—F. M. Fulkerson, Sedalia; W. M. Carter, Sedalia; J. T. Hull, Butler.

Committee on International Dental Congress during St. Louis World's Fair, 1903.—William Conrad, B. L. Thorpe, H. J. McKellops, F. F. Fletcher, A. H. Fuller, Walter M. Bartlett, W. F. Lawrenz, all of St. Louis.

Next place of meeting, Sedalia, first Tuesday after July 4, 1901.

HARVARD ODONTOLOGICAL SOCIETY.

At the January meeting of the Harvard Odontological Society the following officers were elected, and were inducted at the February meeting:

President, Dwight M. Clapp, D.M.D.; Recording Secretary, Joseph T. Paul, D.M.D.; Corresponding Secretary, Robert T. McF-

fatt, D.M.D.; Treasurer, Lyman F. Bigelow, D.M.D.; Editor, Harry W. Haley, D.M.D.

Executive Committee.—Joseph T. Paul, D.M.D., Chairman; William P. Cooke, D.M.D.,; Frank T. Taylor, D.M.D.

ROBERT T. MOFFATT,
Corresponding Secretary.

FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

THE eighteenth annual meeting of this Society will be held at Galesburg, Ill., Tuesday and Wednesday, September 25 and 26.

ARTHUR G. SMITH,
Secretary.

NORTHEASTERN DENTAL ASSOCIATION.

THE sixth annual meeting of the Northeastern Dental Association is to be held at the "Eloise," in the city of Providence, R. I., October 16, 17, and 18, 1900. The Committee has secured the most desirable and commodious building for the meeting ever obtained for such a purpose, and strenuous efforts are being made, with the most gratifying results thus far, to make this meeting the best in every way ever held, at least in New England. Prominent men of the profession have been secured for clinics and papers, the exhibits will be large and so separated from the scientific portion of the meeting that neither will disturb the other. It is earnestly hoped that a large attendance will result.

EDGAR O. KINSMAN,
Secretary.

THE International Dental Journal.

VOL. XXI.

OCTOBER, 1900.

NO. 10.

Original Communications.¹

SEVENTEEN SUPERNUMERARY TEETH.

BY DWIGHT M. CLAPP, D.M.D., BOSTON, MASS.

A VERY interesting case was recently referred to me by Dr. T. M. Rotch, of Boston, the eminent specialist in children's diseases. The patient, a girl a little under seven years of age, slight, and of a nervous temperament, had never erupted the left temporary cuspid.

Fig. 1, from a photograph of a model of the mouth, shows the absence of this tooth; also the presence of a considerable swelling in the region of the cuspid root.

Figs. 2 and 3 are from X-rays, different positions of the mouth. They show the temporary incisors, their roots being nearly absorbed. In Fig. 3 the permanent cuspid is clearly seen, and both Figs. 2 and 3 show some kind of a tooth corresponding to the permanent lateral; also the permanent bicuspids. Both cuts show the place that should be occupied by the root of the temporary cuspid to be filled with a jumbled-up mass of something corresponding in density to about that of ordinary teeth. What this mass was I could not determine, Fig. 2 showing that it was not connected

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

with the tooth above, and Fig. 3 that it was probably distinct from the bicuspid.

The half-tone reproductions, although very good, indeed, do not show the same definition that can be clearly seen in the X-ray negatives.

I concluded that an operation was advisable, although there had never been any pain or disturbance of any kind at or near the affected part.

On May 26, 1900, the patient was etherized, and I removed from the swelling the seventeen supernumerary teeth shown in Fig. 4. I have placed beside these teeth an ordinary superior lateral, so that the corresponding size of the supernumerary teeth may be seen. The illustration is almost the exact size of the originals.

The teeth seemed to be each enclosed in a tough, connective-tissue-like membrane, and the whole encysted, something like a bunch of grapes, in a pocket in the bone, there being the merest shell of the alveolus covering the cyst externally. The illustration gives a very correct idea of the shapes of these teeth.

Each is composed of bone and enamel, and has its separate nerve-supply canal.

Figs. 5 and 6 are reproductions of X-rays taken after the removal of the supernumerary teeth.

In Fig. 5 the permanent cuspid is very clearly shown, and the bicuspid is especially well defined in Fig. 6. Both figs., especially Fig. 5, show that the place of the permanent lateral is occupied by what appears to be a perfect bicuspid.

I shall watch with peculiar interest the development of these teeth, and hope in some future number of the JOURNAL to continue their history.

The patient made a rapid recovery, there being no unfavorable symptoms attending the operation.

FIG. 1.

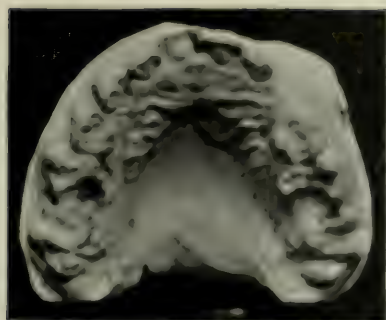


FIG. 2.



FIG. 3.

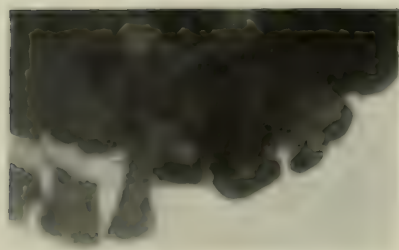


FIG. 4.



FIG. 5.

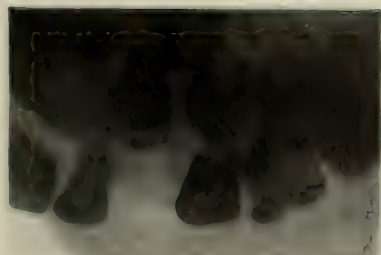
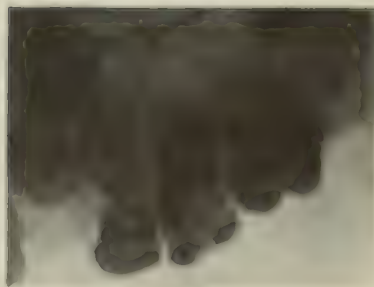


FIG. 6.



MASTICATING STRESS.

BY B. F. ARRINGTON, D.D.S., GOLDSBORO, N. C.

THE *Dental Cosmos* for June, 1895, contains a paper written by Dr. G. V. Black, in which he says, "In the *Dental Cosmos* for May I have given in some detail studies of the physical character of filling-materials. It is necessary to determine as nearly as possible the stress to which they will be subjected in the human mouth. This requires of us the determination of the force with which the teeth may be brought in occlusion by voluntary effort, and the stress usually employed in eating or in the usual mastication of the different articles of food. These determinations seem necessary as a basis for decision as to the strength required of materials to prevent them from being crushed or dislodged by the stress of mastication when placed in the teeth as fillings."

Then the doctor discourses at length upon the subject of force requisite in the ordinary mastication of food and sundry articles, and proves conclusively, he seems to think, by the use of his *phagodynamometer*, that his statements are correct and must stand as truth established on a scientific basis and by strictly scientific tests performed in the presence of men of prominence in the dental profession.

His tabulated statement of masticating force requisite for crushing various articles named, with one exception, varies from fifteen to one hundred and seventy-three pounds for each occlusion of the jaws. The statement and exhibit he makes are most unreasonable and extreme, and have no feature of strength rightly based to sustain them, and can be easily proved erroneous and misleading by the use of a simple and much more practical contrivance, easily improvised for testing strength and endurance of the muscles called into action in the exercise of masticating food, than the phagodynamometer, to which Dr. Black and others attach so much importance.

That the little instrument so favorably endorsed by Dr. Black will crush meats and crack nuts and candies under the stress of lever power as applied by Dr. Black, no one will doubt, but to sanction his theory and claim, that it measures and marks correctly in pounds the stress of crushing force requisite in the ordinary process of mastication, would be an unreasonable stretch of credulity.

and it is asking too much of the dental profession to accept any such theory, unless better sustained by features and facts based upon practical as well as *scientific* principles, that tests made and results obtained may stand as truth and strengthen with time.

Dr. Black will of necessity have to devise and produce a better testing-machine, one more trustworthy and correct in its workings, before he can reasonably hope to prove to the profession that amalgam fillings in cavities will *flow* and *spread* under *ordinary masticating stress*, or any other order of stress possible to be applied to fillings in teeth.

The *flow* theory is weak, very weak, and it will be difficult ever to strengthen and sustain it, from the fact that there is no reasonable and secure foundation in fact to build upon. Sometimes, in attempting to carry a point in effort to strengthen a weak theory, the theory is more weakened and the sooner proves a failure, as in this instance of *stress and flow* advocated and championed by Dr. Black. Extremes and false theory never operate for good in any cause. Emanate from what source they may, they never savor of good. Let them go and go quickly if possible; the sooner out of sight and forgotten the better.

All will admit and none question the extent of possibilities of the extreme force that can be temporarily exerted in the exercise of the occlusion of the jaws in biting or cracking hard substances, but to say amen to Dr. Black's teaching pertaining to the subject, and endorse his tabulated exhibit of stress to sustain his theory of "amalgam flow," would be a stultification of independent thought, judgment, and the right to investigate. It would prove a hinderance to true progress in professional work, and would greatly tend to establish a hurtful precedent, a willing acceptance of false theories.

The doctor, in his scientific efforts to establish and sustain his point that amalgam fillings *flow* under *masticating stress*, seems to have lost sight of the fact that he imposes an unreasonable and unbearable tax upon the peridental membrane and the few muscles called into action in the occlusion of the jaws, to say nothing of the teeth, a tax far greater than the possibility of membrane and muscular endurance, too extreme and impractical to be favorably entertained and considered as a possibility for a single moment.

To make the subject brief, I will mention and comment upon three articles only enumerated in the doctor's statement of ex-

perimental tests as recorded, pages 483 and 484. He says, "In the ordinary or usual process of mastication, beef-steak well done and rather tough requires a stress varying from sixty to eighty pounds, lemon-drops from sixty to seventy-five pounds, and hazel-nuts, old and dry, from one hundred and fifteen to one hundred and seventy-three pounds." Eight were tested, and made an average of *one hundred and forty-seven pounds*. Just think, and for each occlusion of the jaws! Strong muscles, certainly.

As regards beef-steak, it will not require argument or effort on any line to convince any one at all familiar with children and their accustomed habits and indulgences at table during meals that the majority of them at the age of seven or eight years, with only four permanent molars and temporary teeth, possibly defective, will masticate beef-steak easily and quickly and without apparent effort. The occlusion of the jaws during a single meal will possibly range from one hundred and fifty to two hundred and fifty, a reasonable estimate; for average, say, two hundred occlusions during a meal and *seventy pounds* stress for each occlusion, according to Dr. Black's showing the result would be fourteen thousand pounds,—out of all reason and contrary to sound judgment and facts, and cannot be established and sustained by science ordinary or extraordinary, with the aid of the phagodynamometer or any other machine yet invented. Such a strain and tax upon the anatomy involved during the exercise of eating a meal, a period of fifteen or twenty minutes, about the usual time consumed by children at table eating a square meal, embracing beef-steak, would soon prove hurtful and destructive beyond possibility of repair and restoration to a normal state. Couple with this unreasonable and extravagant feature the fact that not one child in fifty of mentioned age is equal to the task of lifting and shouldering a weight of sixty pounds, the minimum claimed by Dr. Black as requisite in occlusal stress in eating steak. With the whole muscular exertion and strength of body put forth, such a feat at such an age could not be performed.

I will ask, and Dr. Black can explain possibly, how it is possible for the few muscles involved to undergo such strain and affect the extreme stress he represents to be common to all? In my judgment there can be but one fair and honest answer given that is reasonable and will be acceptable, and that is, that beautiful little piece of scientific, mechanical ingenuity, the phagodynamometer is in fault.

It has played deceptive and fooled many, consequently should be investigated and carefully looked into and made to do better work, and stop misleading the easy-to-be-led.

In reference to hazel-nuts and lemon-drops, said to require such extreme muscular force and strength of jaws for cracking and crushing, I will relate results of some recent experiments on that line, which possibly may interest some. I procured of a confectioner hazel-nuts and lemon-drops, and found a boy about eleven years old who was willing for a small compensation to exercise his jaws as required. The boy was of average build and weight, with teeth that might be classed fair average. He commenced with the hazel-nuts, placing one at a time between the molars on the right side, and continued cracking and removing from his mouth, without cessation, until he had cracked one hundred and fifty, and in less time than six minutes. Then, without waiting, proceeded to crack (one at a time) the same number of lemon-drops, and in about the same space of time, altogether less than twelve minutes, and without perceptible fatigue or strain of muscles in evidence. The boy expressed satisfaction and willingness to repeat the performance immediately if desired. Estimating according to Dr. Black's tabulated statement of stress requisite for cracking hazel-nuts and lemon-drops, the average foots up as follows: One hundred and forty-nine pounds each for hazel-nuts and sixty-five pounds each for lemon-drops; total thirty-one thousand eight hundred pounds; as would be claimed and proclaimed by the converts and advocates of the phagodynamometer. But there was no such stress applied in cracking of nuts and lemon-drops by the eleven-year-old boy, let the machine talk as it may. As perfect as it may be in mechanism, it is not suited to determine correctly the occlusal stress of muscles in eating. It is due to truth, to science, and to deceived and misled dentists to so state. Time and investigation will confirm and sustain the correctness of my statements. I must state that the boy who cracked the nuts and lemon-drops was put to a test for exhibit of physical strength, and with all the muscular power at his command failed to lift a weight of seventy-five pounds, a weight less by seventy-two pounds than the stress required for cracking a single nut as measured by the phagodynamometer, which has during the past few years caused so much talk and played such a conspicuous part in deluding and leading astray many good men in dentistry.

It shows how easily disposed and willing we are to accept a new theory, said to be scientific, when intelligently and pleasantly presented, as Dr. Black is competent to do, and without questioning or testing as best we can to determine whether it is sound or unsound. All men are liable to err, and "all are fallible." I must do Dr. Black the justice to say I believe he would as willingly and quickly correct an error detected in his scientific work as any man living, and that is all that can be required of him as a scientist and an honest dentist, but we hope that wherein he has erred he will not be "forever and a day" finding it out.

Scientific work in dentistry must not be ignored; it is useful and much needed; but we want that it shall be truly scientific and conform to the practical, and harmonize on a basis of good sound judgment, reason, and common sense, that facts when established may be relied upon.

We will hope the time is near at hand when Dr. Black will realize the necessity for revising his experiments and testings, and will so correct, pertaining to masticating stress, as to make his scientific labors on that line perfectly reliable and more universally acceptable than at present, and will openly and frankly say to the profession that he fully realizes wherein he has erred, and, like others, has been misled by that unreliable little pet of his, the phagodynamometer, and that he is now satisfied that, after all his efforts to prove otherwise, it is not so essential that amalgam shall be so extremely hard to resist *masticating stress*, as *flow* of amalgam fillings under ordinary masticating stress is really not within the range of possibilities, viewed from a reasonable practical stand-point (the best point that can be made), especially as it is reasonable to presume that in the absence of the phagodynamometer the occlusal force in masticating ordinarily will not require a stress exceeding a few pounds.

In the event of Dr. Black failing (and fail he must) to sustain his theory pertaining to masticating stress, wherein is there a feature of profitable, practical benefit to dentists in all that he has written and figured on the subject to establish his theory of the extreme stress of mastication and consequent *flow* of amalgam fillings under such stress?

It is sad to think of the loss of so much valuable time and talent that might have been more profitably appreciated. But such is life, and we take the chances.

Dr. Black says, "Dentists have not been in the habit of thinking of the force of mastication as so much in pounds, and when the tests are made and the facts are stated in print many hesitate to believe them, because they have a sentiment that the figure is too high."

A little more sentiment than the doctor has practised would possibly have made his scientific work more effective and reliable. Dr. Black's theory is based on scientific laboratory work, so claimed. What I have said, and the experiments stated, may be based on sentiment. I will ask that any or all interested on the subject test both carefully, with a close study of the anatomy involved, and experiment for results to determine which is practical and which is truth, and decide for themselves if in their judgment and experience there is truly any such thing as flow of amalgam fillings under masticating stress.

To get at truth rightly, especially when confronted by such an ingenious story-telling little machine as the phagodynamometer, we are compelled to experiment a little now and then; otherwise where might we not drift, and what of the consequences?

OXIDE OF ZINC AND EUGENOL AS A COVERING TO PULPS.¹

BY S. B. LUCKIE, D.D.S., CHESTER, PA.

THAT which makes the mixture of oxide of zinc and eugenol of value is that it possesses the properties of a good protector to the pulp, a therapeutic agent and a filling-material combined, and can be used as either one or all, if desirable, in the same case. It makes a good covering for arsenous acid, as it can from the peripheries of the cavity be domed over the application, thus avoiding pressure, and, being a soothing obtundent, adds to the possibility of lessening or preventing pain, so likely to follow arsenical dressings.

The evidence of its having therapeutic properties comes from clinical observation alone. Teeth that have ached from pulpitis,

¹ Read before The New York Institute of Stomatology, May 1, 1900.

after having the pain relieved, if filled with it, will often remain comfortable for months, extending into years in some cases.

Eugenol, as given by Merck, is antiseptic, anti-tubercular, and a local anæsthetic. Oxide of zinc is a tonic, antispasmodic, and astringent; in general medicine it is used as an astringent on excoriated surfaces, either by sprinkling or in the form of an ointment.

What therapeutic advantage, other than to make a mechanical agent to protect from external irritation, is gained by mixing the two drugs I have not been able to find out. If, however, the properties of each be retained after the mixture is made, it is hard to conceive of more desirable properties for a lining or as an intermediary in deep cavities.

While its virtues are many, I do not wish it understood that they are extolled to the same degree as is done for proprietary cements for pulp covering and dressing; it will not in all cases maintain comfort in all the stages of pulpitis, nor does it do away with all pulp devitalization and extirpation, but in the hands of the careful and conscientious practitioner it will aid in giving comfort after filling in those cases of sensitive dentine and of deep-seated caries, and very greatly reduce the number of cases of pulpitis and pericementitis that occur in filled teeth. It can be used to fill deciduous teeth where it would not be wise to prepare the cavity for a metal filling, and is often preferable to gutta-percha, as its use is more possible to maintain comfort and prevent pulp and periodontal complications. It makes a good trial filling where caries have approached very near the pulp, and if no complications follow, when worn away it can be covered with amalgam or gold.

In those teeth where the pulps had died under a filling of oxide of zinc and eugenol, the first case is to be presented with the pulp putrescent and foul smelling, the contents of the chamber and canals always being dry, and there being no exhibition of periodontal irritation. Of course, it is to be understood these were cases seen before the filling had wasted sufficiently to allow the fluids of the mouth to enter the pulp-chamber.

As an intermediary under zinc phosphate fillings, it will prevent the phosphoric acid from irritating the pulp. In all cavities of much depth on the occlusal surfaces of bicusps and molars it should precede the filling, and in approximal cavities a pad of it should be placed on the region overlying the pulp, the mix being

made quite thick to hasten the setting, and the cavity walls be covered with a quick-drying lining and filled with whatever material is designated.

To enumerate, the cement made from oxide of zinc and eugenol is useful to fill cavities with exquisitely sensitive dentine for a period of time elapsing from a few weeks to months, as a trial filling, as an intermediary in deep cavities, as a covering for pulp- and canal-dressings, and as a non-removable canal-filling. As a canal-filling it can be used with advantage on account of its slow setting, allowing more than ample time for its introduction. The method adopted for canal-filling is to pump it in with Swiss broaches until all possible parts of the canal are apparently reached by it, when a cone of temporary stopping is placed in the canal and pressure made towards the apex.

With an experience of about six years, it has been a valuable aid in the treatment of teeth and in preventing the discomfort from thermal changes that so often follow their filling. I am not unconscious, however, that it might be improved by the addition of other antiseptics; indeed, it has often occurred that a series of bacteriological experiments might be conducted with advantage to prove the value of different intermediary used between filling and dentine, or as pulp-caps.

Aristol or hydronaphthol can be mixed with oxide of zinc, in about equal quantity, and, if mixed with eugenol, a cement with about the same degree of hardness is obtained, though clinically I have obtained no advantage from the addition.

THE SUCCESSFUL DENTIST.¹

BY E. H. RAYMOND, D.D.S.

THE practice of dentistry to-day calls for more careful and thorough preparation, untiring research, and masterful application than ever before. The progressive development of the age almost bewilders one, and the innovations in every department of art and science show the versatility and activity of man's mind.

¹ Read before the New York Institute of Stomatology, May 1, 1900.

While dentistry as a specialty is prehistoric,—which specimens found in Etruscan tombs will prove,—there has been such a substantial advance in recent years, owing to the knowledge obtained by investigation and invention, that we are to-day behind no other profession known among men. At the end of this nineteenth century we can with pride claim the distinction of representing a profession and an art which combines in itself for its perfect accomplishment a wider range of talent and skill than many others,—an art which requires the educated eye and the cultivated taste of the artist, the wisdom and experience of the physician, the judgment and ability of the surgeon.

The importance of the teeth and their function to the health and comfort of humanity has stimulated the efforts of many of the leading and most scientific minds to devote their life-work to the preservation of these organs and the treatment of all the diseases of the oral cavity. This universal importance naturally creates a universal demand for the trained mind and hand. If the teeth were exempt from disease and disintegration, there would be few oral lesions to jeopardize the health and comfort of the race. Perfect trituration of food would insure proper digestion, and this in turn proper assimilation, preventing an overworked stomach and insuring normal processes in tissue-building throughout the body when proper food is taken.

Aside from this physiological consideration, the symmetry of the face and the pleasing expression are marred by the absence of, or by unsightly, teeth. Jewels of the rarest are secondary to them. Health and beauty depend upon them.

The high civilization of our time and the scientific preparations of food-products make it possible for every one to subsist on that which will provide for the nutrition of all the tissues of the body. There are health-food companies whose aim it is to counteract the tendency of our people to cultivate an appetite for such things as "tickle the palate," but which fail to make good blood for the nutrient supply of the various tissues of our bodies. Unfortunately, too few, from carelessness or ignorance, avail themselves of this, or provide for their growing children these substantial preparations, which nature demands to be taken into the system. Pale faces, nervous temperaments, delicate constitutions with frail teeth, and suffering, too often present themselves. Realizing, therefore, our important mission, what does this realization impose upon us?

First, an absorbing love for our chosen pursuit, and knowledge of and fitness for it.

There is one lot common to all,—the necessity to labor. Every advance that is made, whether in wealth or honor, must be made by effort; and by a gracious law of compensation, exercise develops both mind and body to greater capabilities. So surely does success follow well-directed effort, that the world long ago coined the proverb, "Labor conquers all things." On the other hand, rust not more surely tarnishes the keenest blade than does sloth and idleness impair or destroy every hope of success in any vocation.

A second motive which impels one to successful effort is the love of pre-eminence. Lurking in the breast of every one, oftentimes without the consciousness of its possession, is the feeling of gratification and pride in being pointed out to others as having attained some real or fancied superiority. The pride of success, which having once been felt and becomes so strong an incentive to activity, is but the legitimate offspring of self-esteem and self-respect, essential parts in every noble character. In its proper sphere there is no ambition purer or nobler. The eminence of the statesman, the glory of the warrior, the fame of the scholar, the reputation of the physician, the skill of the dentist, find in deserved praise not flattery, but a worthy ambition. While every one cannot be the superior of everybody else, while there are not virtues and excellencies enough to go round so that all may take an honor, it is the ability that one has to take from the material in the world, which has no distinct individual excellence, or character, and work upon it by a higher and nobler nature, and thus glorify it, which is the incentive that should enlist the earnest zeal of the dentist who hopes for distinction. It is this sentiment in working which achieves the greatest successes; which combines all the energies of mind and body in harmonious action; which takes note of neither time nor place in its absorbing interest; which takes from labor its character of toil and makes it minister to the highest enjoyment of life.

Another motive as an element essential to success is that of compensation. It might be stated as an axiom that there is one central point from which is graduated the value of every attainment, whether in literature, art, power, fame, or wealth. Like the nerves of the body, starting from the brain and pervading every minute atom of the system, so does the mysterious influence of this one ele-

ment exert its power in every department of human endeavor. This material tangible and central power is money, whose ultimate representative is gold. What one action or thought is there or has there ever been that has not directly or indirectly its measurement in gold? It builds the road-bed and ties the rails of every railway; tunnels the mountains and fills up the valleys; builds the temples of religion as well as the temples of mammon; ministers to the luxuries of the rich and the necessities of the poor. It is, in short, the lever that moves the world. We claim no exemption from a law so universal, and set it down as no unworthy motive,—the hope of adequate reward as an inducement to labor.

While the field of the dentist may be circumscribed, the influence and results reach through the whole system. While the organs upon which most of his time is devoted are small, they represent the highest type of organized life, the perfected result of vital force. The structures upon which he works, the materials with which he labors, the love of blessing others, the love of benefiting himself, are all calculated to enlist an enthusiasm unknown to men in the ordinary business of life. With so much of power, by skill and delicacy of touch, to smooth the countenance distorted with pain, to quiet the nerves tingling with agony, to restore health for disease, beauty for deformity, and to change the atmosphere of decay to that of purity and sweetness,—by so strong a charm does dentistry win and hold its votaries.

Now for some very practical points,—do and do not.

The surgical treatment of the mouth is not the sole function of the dentist. Too many have failed of success because they have aspired to being surgeon-dentists, and have paid too little attention to the mechanical requirements in the office. Mechanical skill is as essential to success in dentistry as light and heat are to growth in the physical universe. No dentist ever made a name for himself without it. He may be competent as a diagnostician, but if he would—and he should—operate in such cases as antral disease, epithelioma, pyorrhea, etc., his skill must be pronounced, or mutilation of patient and humiliation to himself will be the result.

Let patients see at all times that we understand our business. Inspiring confidence acts as a first cause in gaining their respect as well. The patients' confidence in and respect for their dentist is the keynote to a successful career for him. A reputation once established expands in all directions, but it needs to be jealously

guarded and carefully nourished by faithful service and unremitting toil. If faithful, he will never lose it.

Cultivate the grace of patience. There is nothing more trying to a man than to operate for a delicate, nervous patient, be it adult or child, but, called upon to do so, a man must exercise the best qualities of his being,—sympathy, gentleness, and a consideration for the patient to the last degree,—and use every means possible to prevent suffering. In this day of enlightenment there is no necessity for inflicting severe pain in our operations in the mouth. Little pain need be given, even in the most sensitive tissue. People will go a long distance to get into the hands of a gentle, careful operator, and they will not hesitate to speak of these qualities to others.

A man's temperament and natural traits of character, coupled with his ability, will determine the class of patients he is to minister to. His individuality has more to do with this than his environment, although the latter is important. If we are to serve the best, we must be the best and give the best. We should be deliberate in our operations, and render our best services in every case.

Be prompt in meeting engagements. A patient's time may be as valuable as an operator's, and the patient has as much right to charge for loss of time, especially if he be a business man. Avoid long sittings, unless absolutely necessary. People will dread the operating-chair if they are unduly fatigued by them. The operating-room should be the cleanest place on earth, and conspicuous for its healthful atmosphere, and the absence of the smell of drugs.

Never put into the mouth of a patient any instrument that has not been thoroughly cleansed.

Never inject cold or cool water into a sensitive cavity.

Never fill a cavity of decay of any nature without thorough antiseptic treatment.

Never go from one patient to another without washing the hands; and keep the mouth clean and healthy, so as not to be disagreeable to patients.

Never use a napkin or rubber dam that has been in the mouth of another.

Never experiment in the mouths of those who trust us, without an understanding beforehand. If we do, and fail, it will drive them away.

Never charge for a failure in any operation. Do it over until

successful before rendering a bill. No man is infallible, and every one will occasionally make a mistake. Acknowledge a mistake when made. It will pay better than to try and conceal it. Never warrant an operation. We are dealing with living tissue, which is susceptible to change from many causes. Instruct patients as to the proper food for growing children; also as to the importance of keeping their mouths in condition to eat it.

Have a system for charging for services, and stick to it. The value of skilled labor cannot be measured by money, but it is best to have a system. People will know what to expect when such is the case, and it may save much controversy.

Never solicit patronage, but let the service rendered determine our ability.

Never advertise. It violates our ethical code, and sours of quackery.

Be careful not to speak disparagingly of a brother dentist. If he has made mistakes in diagnosis and treatment, endeavor to rectify them, without comment.

Be cheerful at all times in the office, and let the urbanity and polish of the gentleman shine out on all occasions. Keep in touch with the brethren, and strive to contribute something towards professional advancement.

SOME OF THE NERVE REMEDIES.¹

BY DR. EDWARD C. BRIGGS, BOSTON, MASS.

THIS is the subject as put down by the master of ceremonies, Dr. Cook. It is a very large one, and I do not wish to take your time by attempting to cover it. I will simply confine myself to the use, not of the remedies with which you are all familiar, but to the coal-tar products in their application as remedies to help in relieving pain where surgery is delayed or impossible at the time. It is sometimes necessary that the dentist should give his patients medicine to help them while making a diagnosis of the case, and if you will familiarize yourselves with a few drugs, you will find that

¹ Read before the Alumni of the Harvard Dental School on Alumni Day, June 25, 1900.

it is of great benefit to use them. Morphine and the other alkaloïds of opium have always been shunned by dentists. Our experience has been that the patient after taking these drugs was rarely helped and almost always put into a condition of general malaise, which made other treatment impossible or, at least, difficult.

If a patient is threatened with alveolar abscess, or in cases where it is very difficult to make a diagnosis for twenty-four or forty-eight hours, it is a great comfort that you can give some drug which is positively safe and will insure a good night's rest. Germany is the great producer of these coal-tar products, both for medicine and dye-stuffs. They are proprietary drugs, and for that reason a great many unconsciously class them with patent medicines. But Germany simply controls their manufacture. It is all right to use these drugs, and they should not be classed with the "quack" medicines. These drugs are classed as antipyretics and analgesics, particularly for the fifth pair of nerves.

Antipyrin was discovered in 1884. The action of this is sure, but it has caused nausea and even collapse; and therefore, because it was used in large doses, it became a bugbear to the dentist. In 1887 we found acetanilide, derived from aniline, to be better and safer, and a combination of it with bicarbonate of soda and caffeine (antikamnia) is very efficacious and apparently safe.

Phenacetin has been found to have, in some hands, the effect of producing cyanosis and the diminishing of the urine. It has had great use among the laity. It produces severe prostration in some cases, and depression follows its use and does not always relieve pain. From it the relief is not so decided as some of the others. Lactophenin was discovered in 1893 and used with success.

In 1895 Biechler produced a paraphenitidin derivative which is named kryofine. This combination produces decidedly different effects from phenacetin. Much can be said in favor of this drug. It is a febrifuge and antineuralgic. Ammonal is a product of the amido-benzine series, and is a phenylacetamide, in combination with ammonia to strengthen the heart. These drugs will be found in small doses perfectly safe, and by repeating the dose one can control the kind of pain which dentists are called upon to treat.

I repeat, in many cases where you find you must do something and it is not the time for surgical interference, as the diagnosis is not clear, these drugs given in three-grain doses and repeated

every half-hour until three, four, or six doses have been taken, will almost invariably give the required relief. In alveolar abscess and pulpitis this treatment is efficacious.

It might be well to speak of one of the newer local anesthetics. Orthoform, a methyl ether compound of amido-oxybenzoic acid, can be administered internally, one-half gramme to one gramme several times a day. It is non-toxic, and the anaesthesia is slow and progressive. This makes a very satisfactory preparation to put in in cases of exposed pulp where the pain is severe. It will quiet the pulp, and is also a good thing to put into the socket of a tooth after extraction. Sometimes there will be extreme pain after extraction and a violent neuralgic inflammation set in, particularly in cases of the third molar, lower, and you will find this to be most effectual.

In this connection it is well to remind you also, in the treatment of neuralgia, where you suspect that the tooth or the teeth are not at the bottom of it, although the physician declares it must be so, you should always suggest that he try doses of quinine and see if there is not malaria connected with the matter.

A PATHOLOGICAL SUGGESTION.

BY JOHN A. MCCLAIN, D.D.S., PHILADELPHIA.

A CASE came to me recently which I believe will be of some interest to the readers of the *INTERNATIONAL DENTAL JOURNAL*, both in itself and in the suggestions which spring from it. It was that of a young lady of about twenty-five years of age.

Last November I did some work for her, and in January she came to have a large amalgam filling repaired. It was in the lower right first molar. In shaping for the repair, which involved the filling and the tooth, the pulp-canal was entered, it being a devitalized tooth, at the gingival distal buccal side, and found that the canals and chamber had been filled with cotton which was foul. The cotton was removed and the canals and chamber were cleaned, sterilized, and filled, and the filling repaired. No soreness or pain has been experienced up to this time with this tooth. Along in March she came to the office and said that she had been

having trouble with that side of the jaw, but could not lay it to any particular tooth. She said there had been five swellings, each about the size of a bean, on the jaw externally. These increased in size from the front to the back of the mouth. They had disappeared when she came. I felt sure that the same tooth was involved, and suggested opening up the second and third molars, which also contained large contour amalgam fillings, for I feared that they might contain cotton fillings similar to the one I had opened, which might be the cause of the infection, and might produce more serious results. She would not consent, and I dismissed her after doing some other work. She could not tell me whether the second and third molars were devitalized or not, and I did not test them.

Her next visit was in April, to get relief from what she supposed was another abscess forming. Her face was very much swollen, the swelling even extending down the neck and to the upper part of the thorax. The parotid and submaxillary glands were involved. She could not open her mouth. I examined the mouth with the electric lamp and mirror as well as I could, inserting it through the space left where two teeth had been extracted. The tonsils were very much swollen, and all the tissues on the right side of the mouth by the lower molars, and especially posterior to them, were very much inflamed. On questioning her, she told me that the wisdom-tooth had been sore, but that had passed away. The other two had never been sore.

I wrote a note and sent her to her physician, as I considered her case one for general treatment. He treated her for nearly a week and then sent her back to me, writing me at the same time, saying, "The more I see of Miss J.'s case, the surer I am of some trouble of a septic nature that has caused the adenitis and the spasm of the masseters. Nothing that I can find explains it, and I am thrown back on the supposition that it must be her teeth. Can you find some source of infection? I do not believe that the irritation will subside until the source of the trouble is relieved. I have asked her to see you to-morrow in hopes you may find something."

The next day she came, and after another examination, I still could not see how any of the teeth was the cause, as none was sore. The soreness in the wisdom-tooth which was present at the beginning of the trouble had not continued. After consulting with a

professional friend of years of experience, in whose judgment I have great confidence, I decided to take her to one of the leading oral surgeons of the city for consultation. She consented to go. He examined the case and advised the extraction of the third molar. I requested him to take the responsibility of doing this, as I did not believe that it was the cause of the trouble. When the tooth was extracted, no sign of pericemental inflammation could be found. It was as healthy-looking as any tooth could be, save that the pulp was congested. This congestion, I am persuaded, was a result of the infection and not the cause.

The next day after the tooth was extracted there was a flow of quite an amount of pus, and then followed a gradual subsidence of the swelling and a return of the tissues to a normal condition. The spasm of the masseters continued fully a week after. Where the pus came from I could not discover, although I twice tried. It did not come from the socket of the extracted tooth.

The patient told me that, at the beginning of the trouble, she had more or less fever. She suffered pain up to the time the pus was evacuated.

The second molar has recently begun to abscess, and when opened, the pulp was alive in the anterior root. I have also opened the first molar and found the canals and chamber in an aseptic condition.

This case would perhaps not have been given publicity had not the writer happened to describe it to Dr. M. G. Tull, a neighbor and practising physician. He stated that he had had three cases of infection similar to this one recently, save that there was no discharge of pus. He has kindly consented to give me a brief history of his first case, which is here given in his own words:

"Early in March, 1909, Mr. H., aged thirty years, consulted me for an attack which presented the symptoms of an ordinary case of follicular tonsillitis, there being on the surface of the tonsil a slight cheesy deposit, without marked follicular engorgement, the only pronounced feature being the great systemic prostration, which was altogether out of proportion to the local symptoms. There was no improvement on the exhibition of sodium salicylate in full dose and the local use of sodium salicylate and potassium chlorate as a gargle.

"After two days, a marked infiltration of the mucous membrane appeared, with pronounced edema of the arch.

"A bacteriological examination, made at the time, gave a negative result, as to diphtheritic bacilli, but Dr. Abbot personally expressed to me his opinion that the bacilli were probably present, though crowded out by other germs present. There was at no time any membrane present.

"The constitutional and local symptoms persisting for five or six days, we administered two thousand units of Mulford's anti-toxin solution, which was followed by immediate subsidence of all symptoms and a recovery in forty-eight hours. The prostration persisted for weeks, and had to be met by massage, change of climate, and tonics. The case was seen with me by Dr. Van Sant."

I give the above hoping that third molars may not be uselessly sacrificed, and that the attention of both the dental and the medical profession may be turned to local infection by germs, hitherto unsuspected, in certain parts of the human body. The case which came under my observation looked to me like quinsy, or tonsillitis; but Dr. Tull regards his cases as a local infection by diphtheritic germs, unaccompanied by the usual and more marked symptoms,—the patches on the mucous membrane of the throat.

Abstracts and Translations.

SYPHILITIC LOCOLOSIS ALVEOLARIS (PYORRHŒA ALVEOLARIS).¹

BY G. LENOX CURTIS, M.D., NEW YORK CITY.

FOR more than twenty years I have given this subject close attention, not only with a view to its cure, but to ascertain the etiology of this disease, which is generally regarded as incurable.

Dr. Farrar says, "I believe locolosis alveolaris is a disease of the peridental membrane aggravated by calcareous deposits upon the teeth, which increase the inflammation so greatly that decalcification of the alveolar tissue results, and when this state exists the

¹ Read before the American Medical Association, Atlantic City, June 7, 1900.

advance of loccolosis increases more rapidly until nature makes a serious effort to expel the tooth, and if successful the disease subsides and is lost from view. When all the teeth are lost loccolosis ceases to be observed, showing that whatever the cause of the socket disease, it does not reappear elsewhere."

In an article, "Some Suggestions on the Treatment of *Pyrorrhæa Alveolaris*," by myself, published in the *New York Medical Journal* of January 14, 1899, I gave my views in regard to its treatment. I propose now to give some of my views upon the causes of this old and destructive disease.

Up to about twelve years ago I had treated several hundred cases of what I then supposed to be *pyorrhæa alveolaris*. But in the light of later knowledge I am of the opinion that only recurring cases were worthy of that appellation. At that time I boldly resorted to all methods then in vogue, and freely referred my cases in consultation to those whom (from their writings) I believed to know most on the subject. Degeneracy, due to uric acid, and rheumatism were suggested, and as I found the rheumatic and gouty tendency in some patients having the disease, I inclined to accept them as a cause, if not the cause. But later, when the treatment did not effectually suppress the disease, I was satisfied there must be something else behind it all which should be learned. Reviewing the history of many of the most obstinate cases, I found that in several I could trace syphilitic association. Believing much information might be gained, I followed this trail, and have continued so doing from that time. It was difficult to secure sufficient data, however, by which I could prove scientifically that which I suspected, for, as we all know, syphilis has such an insidious undermining effect, and patients are generally so unwilling to admit facts, that the study has many discouraging aspects. It is, however, my opinion that this disease does not alone show itself in those persons who have contracted it, but may also be found in the mother as well as her offspring. It was in these cases that I found loccolosis or *pyorrhæa alveolaris* to be so well defined that I felt encouragement. But obstacles arose which retarded my speedily reaching a definite conclusion. It was my hope at this time that I might gain something by turning these cases over to specialists in syphilis, gout, and rheumatism for treatment, but the varied results led me to suspect, and to be cautious in speech until I could get sufficient verified data to act more intelligently.

In many cases I found that treatment had not been continued sufficiently to eradicate the specific poison or the secondary effects thereof. In 1890 I had an opportunity to study blood, and then it was that I became convinced that the usual method of physiological study of this pabulum was inadequate. I now believe the blood carries with it the active principles of most, if not all, diseases. Then the generally accepted plan for the examination of the blood was through dry and stained specimens. Even to-day that plan is largely followed. Could any but the most tenacious germs stand the baking process which is claimed to be unavoidable? Not only are such specimens exposed to oxidizing influence of the atmosphere, but to heat which is of such a temperature that it is injurious to them. It might be said that only the survival of the fittest can furnish the possible opportunity of study, and then they can be recognized only after a course of staining that decorates them in "war paint," chiefs of their tribe. In Von Ziemssen's "Practice of Medicine," vol. iii., page 40, we find that Kircher in 1695 claimed disease to be due to living organisms, but it was not until 1772 that Lestorfor claimed to be able to distinguish, by microscopical examination of the blood, the presence of syphilis and other diseases.

In 1890 Watkins, after studying various methods of blood preparation, came to the conclusion, and published the fact, that there was only one method of scientifically examining the blood,—namely, doing it in its fresh state, and before any changes had taken place. He also found that by instantaneous photographing fresh blood, objects which would otherwise be overlooked would be revealed and permanently recorded, showing facts that the dry and stained specimens would fail to do.

In 1892 my attention was called to Dr. Watkins's method, and it so favorably impressed me that I have since devoted considerable time to it, and now I am so convinced that it is the only road to an accurate diagnosis of disease that I am still continuing the accumulation of data, with more or less satisfaction, having for my chief guide a sign in the mouth which I first observed many years ago, but the importance of which I then failed to appreciate. This sign, which I denominate "egg-skin eschar," I find upon the mucous membrane extending along the ramus and the buccal surface of the gums along the molars. Occasionally it is to be found upon the cheek, near Steno's duct and the angle of the mouth. But I

will not dwell upon this point, as I referred to it in the discussion of my article above alluded to.

In the early treatment of this disease, when I found this eschar present, as it was in many cases, I learned to associate it with some obstinate forms.

Five years ago I began sending patients to Dr. Robert L. Watkins, of New York City, for blood examination, with the view of ascertaining what existed. This I did without giving Dr. Watkins the history of the case. The examination of more than one hundred cases revealed strong evidences of syphilis, and in every instance when the egg-skin eschar was found the blood showed unmistakable proofs of the taint; in fact, every case where the blood showed this the egg-skin eschar was present. Dr. Watkins has repeatedly pointed out to me the syphilitic spore. Yet I must admit that the majority of my patients declared that there was no foundation for the suspicion of the disease. But when they received treatment for it, they were cured. Although some patients were honest in not knowing the history of their trouble, others did finally remember that they had contracted the disease, and others still acknowledged it at once.

So confident do I feel that my views are correct, that I now treat all cases of this kind with antisymphilitic remedies, and I find that a large percentage of them are benefited. In several cases I have been misled, and diagnosed suppurative gingivitis as pyorrhea alveolaris. This I did because I could not find the egg-skin eschar, and when the blood was examined and seemed to substantiate my suspicions I refrained from giving specific treatment. To settle the question, I placed several patients suffering from suppurative gingivitis under specific treatment. This caused such unfavorable symptoms that I was soon forced to abandon it. In one case where the alveolar process, on the palatal surface of the teeth, was nearly destroyed and where it was practically in a normal condition on the buccal and labial surfaces, I was puzzled to know why this affection was not general. When septic pelpe, salivary calculi, and syphilis were excluded, I concluded the trouble to be caused by the pressure from a vulcanic plate to which was attached an artificial velum that had been worn twenty years.

In another case, the root of which I have here, the disease was extreme in character. There was great destruction of the interdental process, accompanied with a discharge of pus. Many of the

teeth could readily be forced by the finger one-eighth of an inch farther into the socket. A tumor, osseous in character, extended along nearly the entire length of the alveolar process, on the buccal and labial surfaces, of the upper alveolar ridge. There was, however, a break in the line of the tumor between the right central and right lateral incisor. The right central incisor had been extracted several years earlier. In this space was an artificial crown attached to a small bridge-piece, as indicated on this cast.

The cast of the lower jaw showed, by the hypertrophied condition of the gum, the extent of the pocket. At first this patient persistently denied ever having syphilis, but the evidence of it was proved by examination of the blood. After I had gained the confidence of the patient, however, he admitted that he had contracted the disease a dozen years before, but had been under treatment for it. He gave as a reason for denying the fact that he did not wish it known to any one except his physician, who had positively stated that he was absolutely cured. The patient now returned to this physician, told him my views as to the cause of the tumefaction, and that I said he was still suffering from the taint. The physician made light of the diagnosis, and persuaded the patient not to return to me.

I regret not having an opportunity to finish the treatment of this case, as it would have been an excellent support to my belief that this class of tumors is the result of this dreadful poison.

It is fair to state, however, that within a year the health of the patient so completely failed that he was advised to visit the Hot Springs for syphilitic treatment.

When rheumatism is found to be present in a large percentage of cases, I believe it to be a coincidence, though not the cause. I believe that syphilis so reduces the resisting power of the constitution that rheumatism more easily steps in, much the same way that it may while the system is under any degenerating influence. I do not wish it understood that I believe pyorrhœa alveolaris exists in every case of syphilis, nor that syphilis is found in every case of pyorrhœa. But what I do believe is that some form of syphilis may exist in nearly all obstinate cases of pyorrhœa alveolaris that cannot otherwise be proved. As proof of this condition I mention such cases as do get well and remain so when placed under specific treatment until all signs of syphilis cease to appear, not only outwardly, but when the blood fails to show any evidence

of it whatever. The value of blood examination, which tells when to commence treatment and when to cease treatment in this, as in some other diseases, is evident. I also regard it to be of great importance in diagnosing remote causes. Indeed, I will predict that the time is not far off when examination of the fresh specimen of the blood will be the principal evidence in proper diagnosis. I have sometimes thought that leucosis or pyorrhea alveolaris may be caused by mercurial poison; but investigation does not bear out this surmise, for I have found this disease where there has been no history of mercury given.

Is it not, therefore, reasonable to conclude that this form of this disease is aggravated, if not caused by tertiary syphilis?

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on Tuesday, May 1, 1900, at the office of Dr. Louis Shaw, No. 163 Remsen Street, Brooklyn, New York City, the President, Dr. E. A. Bogue, in the chair. The minutes of the previous meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. Louis Shaw.—I wish to present to the Institute some sets of teeth which were made in Japan; they may be of interest to the members of the society as showing the progress of dentistry in the far East.

Dr. S. E. Davenport.—In these days of quack nostrums and secret filling-materials, it is a pleasure to feel that body stands for the opposite. I believe we prefer to know something about the filling-materials we use and the remedies we prescribe rather than to take them altogether on faith. As scientific men, I think we should not allow ourselves to use anything the component parts of which we are not familiar with.

In that connection I should like to refer to an amalgam which I have used with satisfaction for a year and a half. It is made by

a dentist, Dr. Bement, of Lockport, New York. Upon each package Dr. Bement prints the formula from which the alloy is made. It is sold at a very low price, five ounces for six dollars, which Dr. Bement claims is quite sufficient for any alloy of those metals, leaving him all that a manufacturer's profit should be. I find this amalgam of good color and possessed of good working qualities. Of course, the length of time I have used it is too short for me to make any positive statements as to its durability. I have thought it a privilege to call attention to this amalgam, which is made, and well made, by a dentist in this open and scientific way.

Dr. C. B. Parker.—Is it a quick-setting amalgam?

Dr. Davenport.—Sufficiently so.

Dr. J. Morgan Howe.—I should like to endorse what Dr. Davenport has said with regard to this particular alloy. I have used it with satisfaction for over a year, and the fillings which I first put in with it appear very well to-day. I was induced to use it because the formula is published on the package, and is similar to other alloys that have proved good in use. Dr. Bement has informed me that he would be happy to make an alloy from any desired formula. In conversing with a *confrère* not long ago, he told me of having made alloys from formulæ of which he thought highly, and he suggested to me that it would be well for us to agree upon a formula that met with our approval and have our alloys made to order by Dr. Bement, or some other metallurgist, according to the prescription which we should decide upon. I think we should do this to supply any deficiency there is in the supply of alloys whose formulæ are made known.

Dr. A. H. Brockway.—Can Dr. Davenport tell us how near like Dr. Black's formula this alloy is of Dr. Bement's? Dr. Black's formula is nearly half and half silver and tin, with a small amount of gold.

Dr. Howe.—It does not contain nearly so much silver as Dr. Black's formula and many makes of the quick-setting amalgams with secret formulæ which have been rushed upon the market within the last year or two, but I have found by experience that alloys which do not contain nearly so much silver have made good fillings, and some such fillings put in so long ago as twenty-five years are showing well to-day.

The President.—Dr. Black, you know, does not trust to clinical experience alone. I am now having an assay made of an amalgam

which has done me better service than any alloy I have ever used. I have used it for more than twenty years.

Dr. C. O. Kimball.—I should like to ask Dr. Davenport regarding Shattuck's amalgam, which I know he has used and recommended very highly. What are the relative merits of the two?

Dr. Davenport.—Dr. Bement's alloy works much like Shattuck's, but seems to be a finer-grained and cleaner amalgam.

Dr. Howe.—I wish to call attention, in a very informal way, to the use of eugenol and oxide of zinc, mixed, as suggested by Dr. S. Blair Luckie, of Chester, Pa., in 1898, in the July number of the *Items of Interest*. His paper seemed to be called out by the discussion of a proprietary article at a meeting of the New Jersey Society. Dr. Luckie states in his article of that date that a cement can be made by mixing these two substances together, which answers for a pulp-capping and a lining for deep cavities and a cement to fill cavities with, claiming that it would harden and last as well as the ordinary cements that we use for temporary fillings. I have not used it for this latter purpose, my experience having been confined to the covering of exposed or nearly exposed pulps with this mixture, and I have found it to work so well that I have thought it worthy of bringing to your attention. Dr. Luckie's directions are that the oxide of zinc shall be added to the eugenol and mixed as the ordinary cement until the mass becomes crumbly, when upon working it a little more with a spatula it softens again, admitting of the addition of a little more of the powder. In that way a mass can be made which softens again by kneading, and can then be placed in the bottom of a cavity. I have used it in that way in deep cavities to protect the pulp from the action of phosphoric acid, which it seems to have done very satisfactorily. My experience dates from the publication of Dr. Luckie's article, and I call your attention to it and suggest that it is worthy of a trial. I requested Dr. Luckie to give us the benefit of his further experience, and I am glad to say that he has responded very cordially. I have with me Dr. Luckie's communication, which I will ask the secretary to read.

(For Dr. Luckie's communication, see page 452.)

Dr. Davenport.—I would like to ask Dr. Howe whether he would consider it advisable to use oxide of zinc and eugenol in deep cavities in which he intended to place a gold filling,—does the combination set quickly enough to allow of the immediate introduction of gold?

Dr. Howe.—No, I should think it inadvisable. I have used it in some such manner where the cavities were deep and were to be filled with amalgam, first placing in the lining, then covering it with the oxyphosphate, and then introducing the amalgam.

The President.—Did you contemplate bringing the action of phosphoric acid under this discussion?

Dr. Davenport.—That would be quite pertinent, Mr. President, as it is the action of phosphoric acid from which this cement is to protect the tooth.

The President.—The gentlemen will kindly understand that the reference which Dr. Luckie made in his paper to the reason why he used this mixture is also before you for discussion. It is to be hoped that Dr. Howe will also give us some points thereupon.

Dr. Brockway.—There is a preparation which I have used, called jodo-formagen, which is sold at the dental depots and which seems to answer all the purposes which this mixture does. I have used it for over a year with very great satisfaction. It is used like a phosphate cement. It can be used in many cases where there is an actual exposure without any bad after-effects. I do not know that it is any better than the eugenol and oxide of zinc, but it is, I think, just as good.

I have also used a preparation supplied by Dr. Kellogg, of Peoria, for the same purpose, but the objection to it is that it is a vile-smelling compound. Our friend, Dr. Thayer, got out something very similar, for which he claimed remarkable results. I believe the claim is valid.

Dr. Davenport.—Will Dr. Brockway be kind enough to give us the constituents of these various remedies which he has told us about. Of course, Dr. Brockway would not use anything the component parts of which he was not familiar with. As I understand it, Dr. Luckie has experimented with eugenol and oxide of zinc, finding the combination valuable, and if we can get all the help we need from this substance which we know all about, it seems to me that we ought to use it in preference to the proprietary articles of which we know nothing.

Dr. Brockway.—I believe there must be iodine and formaldehyde in the jodo-formagen, as the name would indicate.

Dr. J. A. Schmidt.—It is composed mostly of iodine, with a small percentage of formaldehyde and some of the essential oils. It works very nicely, although I prefer to use it not anterior to the

second molar, as it becomes green and may stain the tooth. It is an expensive article. If this preparation of Dr. Luckie's will answer the same purpose, it would be preferable from the fact that it is less expensive. I have used the eugenol and oxide of zinc as a capping, and found it worked very nicely. It was in years gone by when we used to cap pulps.

Dr. F. Milton Smith.—I once heard a clergyman addressing a body of clergymen relative to educational institutions, which he said must be thoroughly first-class if they were to obtain thoroughly first-class patronage. "Now," he said, "we are all strictly temperate here and would not drink water unless it was boiled." So we should not use any of these various remedies whenever it is possible to avoid it, unless we know their component parts. However, I have had the misfortune to be obliged to use some things of which I did not know exactly the composition. This remedy which Dr. Brockway has suggested is one of them. When he mentioned the name, the words of Dr. Davenport came to my mind. This cement has been of a very great convenience to me and I have, with Dr. Brockway, had apparently good success with its use. But it seems to me, if Dr. Luckie has anything which he is willing to tell to the profession, and which he has been some little time studying out, if it is anything like as good, we ought to give it the preference.

Dr. Kimball.—I should like to place myself on the side with Dr. Smith. I believe in Dr. Davenport's theory and Dr. Brockway's practice. In other words, I have used the jodo-formagen cement with some misgivings. I do not like to use anything the exact composition of which I do not know. They publish a formula which, so far as it goes, is reasonably satisfactory, but is not complete, so I use the preparation with some hesitation. I do believe most thoroughly in the wisdom, so far as possible, as formulae are brought forward to us which have been carefully proved and of which we know the full detail, and which have been shown to be good, of using them to the exclusion of those preparations of which we are at all doubtful. I think our thanks are due to Dr. Luckie for having brought this before the profession.

Dr. Davenport.—"Dr. Davenport's theory" is not to me a pleasant expression. I do not purpose to pass as a crank in this assembly, nor to convey the impression that I do not use patented remedies. I do use some things the component parts of which I know little, but I use them only when I am obliged to, and as

between such an article and one which has been presented in a professional way, particularly if prepared by one who is skilled in our profession and who knows our needs, I give the latter the preference without hesitation.

Dr. Kimball.—I am glad Dr. Davenport places himself squarely on the side with Dr. Smith and myself.

The President.—I regret there are no further remarks to be offered on this interesting subject. During the discussion I have made a note which I think might very profitably be made the subject of some future meeting. My question is, What should we do when obliged to treat certain roots in which no filling has been placed, but over which a filling has existed for years? Is the eugenol and oxide of zinc applicable here? and why?

Dr. Davenport.—Probably the successful dentist from whom we are about to hear can enlighten us.

Dr. E. H. Raymond.—It is with some hesitation that I present to this body a paper on such a subject as I have selected, as many of you are, and have been for years, eminently successful in the practise of your profession. There are, however, others whose eyes may fall upon the words to be uttered who may be helped by them. It is with this object in view that I ask your attention for a few moments.

(For Dr. Raymond's paper, see page 654.)

The President.—I think we have heard something which might warrant comment from every one present, and we owe our thanks to the essayist. We shall be pleased to hear from those who are willing to discuss Dr. Raymond's paper.

Dr. Kimball.—I have listened, as you all have, with great pleasure, and I wish to express to Dr. Raymond our thanks for his putting it so clearly, so simply, and so beautifully. The successful dentist in my judgment is the man, first and above all, who makes his own character the very best. That, in dentistry, as in other things, is the foundation, and Dr. Raymond rightly emphasizes the importance of the personal element in the case. I do not know of any profession where more is required of personal character than in dentistry. I was very much struck by the remarks which a lady made in my office a few days ago. She said, in a laughing way, but I know that she meant it, that somebody was advising her to go to so-and-so, but she said "No," that as far as her teeth were concerned she must go to a good Christian. She

felt that she was going to a man whom she could trust, and as I say the predominant question in successful dentistry is the question of personal character. If we aim at high ideals of personal life, doing each day our very best, then we shall succeed.

Dr. F. Milton Smith.—I have been very much pleased with Dr. Raymond's paper. My thought has been for years that successful men could be of vast help to at least the younger men of the profession if every now and then they were to give them just such a paper as Dr. Raymond has given us to-night. Not exactly the same material, of course, but material taken from their experience. This thought has been more thoroughly emphasized in my own mind from the fact that my early experiences in a dental office were so barren of advantages. Personal character enters very largely, more so than most of us think, into the elements of a successful dentist. I believe there is no man in this world who ought to have the confidence of those who transact business with him more than the dentist. I know of no one, unless it is the plumber, who is able to steal their money as easily if he chooses, and strange as it may seem, we run across a patient every little while who thinks nothing of disputing his bill, when, if he would only stop to think, he would see how easy it would be for us to have taken advantage of him in other ways. Regarding the instruction which comes from a successful man: The man under whom I made my first studies was a thoroughly good mechanic,—and Dr. Raymond has said that that is very essential: he could put in gold plugs that were splendid and saved the teeth beautifully, but when you have said that you have said about all. He knew nothing about handling patients, and had no system of charts or anything of that kind. When he had the dam on ready for a gold filling, it was nine chances to one he would call me from the laboratory and send me after the gold. This man never in his life received an income from his practice of more than fifteen hundred dollars a year. Dr. Raymond has referred to the question of care about the person, about the behavior, about being patient and sympathetic. I think in our profession we have the best possible school for patience. I do not know that I would care to go through life again without the lessons which I have learned in this way. Regarding personal cleanliness, an incident happened when I was just a boy, only a few months in my studies, which greatly impressed me. I was visiting a personal friend of mine practicing

in a city up the State. He was a splendid fellow, of elegant appearance, and a successful dentist. I think he was one of the finest specimens of physical manhood I have ever seen. I have to-day fillings in my bicuspid teeth which he put in twenty-five years ago. I arrived at his office just as he returned from lunch, and he proceeded to make his toilet. I think it took him nearly half an hour to get himself in proper shape for the afternoon's work. He had a very busy afternoon, seeing a number of patients, but he did not wash his hands from the time he started in till he finished. This fact impressed me most thoroughly. I shall always remember the remarks of the late Dr. Abbott, which he emphasized in his lectures to the class. "Gentlemen," he would say, "wash your hands every time a patient comes in, and let them see you do it." I believe there is a great deal in this. It is these little things which seem to be slight, but which create the first impressions upon the patient.

I am very glad of having the opportunity of listening to Dr. Raymond's paper.

Dr. L. C. Leroy.—I do not know, Mr. President, that I can say much more than has been said, except that I did not get a chance to say a word on the subject that is passed. I would like to take this opportunity to say that in spite of all the odors that might arise from iodoform, or any other drug that we may wish to use, if there is virtue in that drug that can be turned to our account we should use it. A few drugs, such as iodoform and trichloroacetic acid, are of great value; however, I am very cautious in their use, and do not believe my office has been contaminated with their odors. I do not believe, as I have heard so many times, in discarding a drug simply on account of its fancied unpleasant odor. In the practice of general surgery many measures are adopted which are not agreeable, but which are effective and are not discarded because they are unpleasant.

Dr. Davenport.—We are under obligations to Dr. Raymond for the service he has rendered us to-night, and for what he has done for the readers of our proceedings. Dr. Raymond felt a little hesitation, I know, about presenting a paper upon this subject, but he was advised that we all thought, with him, that a great many young men who were perhaps following with interest the proceedings of these meetings would be benefited by a statement of the essayist's ideas on this subject. I think Dr. Raymond ought to be congratulated upon the facility with which he constructs sentences,

as this is as smoothly written a paper as has been presented to the Institute for a long while. There is very little to be said in the discussion of the paper except to commend it and to give it our cordial acceptance.

Dr. Howe.—I would like to express my gratification at hearing Dr. Raymond's paper. There is nothing which I can say in discussion, and I wish to express my appreciation to the doctor for having done so well what was set for him to do.

Dr. F. Milton Smith.—There is just one thought which Dr. Raymond brought out in the paper which might possibly lead some conscientious young man astray. As I understood him, he said, "Never charge for an operation unless it is successful." Afterwards he says, "Never warrant an operation." I believe that some young men, and older ones for that matter, do operations over for which no charge is made, which never should be done. If I had my life to live over again, the operations which I would do over without charge would be far fewer. An operation may be successful, and still not be successful in the eyes of the patient; and the young dentist, fearing his interests may suffer, loses his fee. Only a few evenings ago, in talking with one of our successful men, he spoke of having rendered a bill for some considerable amount for services. Before the bill was paid the patient came to him again, and on account of the breaking away of the tooth one of the teeth had to be refilled. He then sent another bill which included the last operation. As the bill was disputed, he told the patient that in the first bill he had charged for the very best services he was able to give under those conditions, using his very best judgment and skill, and under those circumstances, the filling having to be replaced, he was entitled for a fair remuneration for doing it. Of course, if the operator feels that the operation could have been done better, he should do it over again, but it is better to be careful the first time.

Dr. Raymond.—I had in mind, when I wrote the sentence in reference to making no charge for a failure in my operations, this fact: Sometimes, while filling a difficult cavity, no matter how careful one may be, some accident, such as moisture, may prevent perfect cohesion of the gold or adhesion of the cement if it be an inlay, and failure results. If within a year such a failure occurs, I do the work over without compensation. In regard to warranting an operation, I have found that it is not a safe thing to do. We

do not know what chemical or mechanical changes may take place in the mouth.

The President.—I think our Executive Committee should be congratulated on the profitable matter they have presented to us this evening, and both the gentlemen deserve our thanks for their efforts. I trust that they will in a future meeting provide us with a discussion of the subject I have already mentioned,—namely, “What do we do when obliged to treat certain roots in which no filling has been placed, but over which a filling has existed for years?” We all know what happens when we open into such a tooth, unless we are extremely careful to open under antiseptics and to properly treat. Now, what is proper treatment? I think we could very profitably listen to a paper upon this subject.

Adjourned.

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REPORT OF THE FOREIGN RELATIONS COMMITTEE OF THE NATIONAL ASSOCIATION OF DENTAL FACULTIES.¹

DURING the past year the work of the Foreign Relations Committee has been materially extended. Advisory boards in most foreign countries have been provided for, and appointments made to fill them as fast as sufficiently definite information to enable the committee to do this properly could be obtained. Pamphlets containing an exposition of the work and the aims of the National Association of Dental Faculties have been printed and circulated in foreign countries, and a number of circulars of information for members of our foreign advisory boards have been printed and mailed to them. In addition, as directed by the Association at its last meeting, a pamphlet containing digests of the reports made at that meeting has been printed and mailed to each member of the Association, and to other interested members of the profession in America and abroad.

All this has involved considerable expense for printing and post-

¹ Reported and adopted at Old Point Comfort, Va., July 14, 1900.

age, but we believe that it has been a wise expenditure of money, as by its means the dental profession of the world has been made aware of the existence of an association of the regular and recognized dental schools of America which is devoted to the advancement of the cause of dental education and to the elevation of the status of dentistry among all nations.

It is unfortunately the fact that, because of the lack of uniformity in the educational systems of the different States, and the absence of any general supervisory authority on the part of the national government, under some unwise local legislation it has been possible for irresponsible, unqualified, and unscrupulous men to secure charters for institutions empowered to grant degrees, and under such authority to issue, for a consideration, irregular and fraudulent diplomas. This traffic has principally been with men in foreign countries, who, primarily the guilty ones, have sought to obtain academic honors without the labor necessary honestly to acquire them. As these institutions have been conducted under pretentious names, it was formerly impossible for foreigners who had no intimate acquaintance with American educational affairs to distinguish between the regular and the irregular schools. The organization of this Association has established a criterion by which they may be judged, only those owning allegiance to the National Association of Dental Faculties being recognized.

It is unfortunate that the professional situation in America has not in past years been better comprehended in Europe. All our schools have been held responsible for the vile work of the fraudulent ones,—nominally located in this country, but chiefly supported by unprofessional men from abroad. There has even been a grave misapprehension of the objects of this Association, and the work of the Foreign Relations Committee has in some instances been totally misconstrued. All of us are aware that while some of the very best and ablest American representatives have located in foreign countries, and to whose professional career we can point with pride, it is unfortunately the case that some Americans of a different professional reputation have gone abroad and have indulged in practices as offensive to our foreign confederates as they are to reputable American practitioners. There are many more unworthy foreigners who have legitimately or illegitimately become possessed of an American degree, and who, without warrant of right, claim the title of "American dentist."

The belief is prevalent in certain foreign professional circles that it is the aim of the National Association and its Foreign Relations Committee to obtain for all such persons professional recognition, and to demand the acceptance of their American degree by the governments of foreign countries. It is but proper that we should in the most authoritative manner deny any aspirations of the kind. This Association has not in the remotest manner contemplated any interference with or protest against the laws or regulations governing the practice of dentistry in any foreign country. It has not primarily been the object of either the National Association or its Foreign Relations Committee to attempt to secure for the American dental degree any legal recognition as a qualification for foreign practice. It is not usual in the American States which have legal professional regulations to receive the diplomas of any foreign professional school as a qualification for practice, and we cannot consistently ask that which we refuse to others.

It seems but proper that we should publicly avow the reasons that have prompted the better colleges to form this association of schools, and to appoint a committee charged with the duty of harmonizing our relations with the dental profession in other lands. We seek for the distinctive American dental diploma nothing more than the consideration which its merits demand. If its reputation has been debased by the circulation of counterfeit diplomas, it is something for which we are in no way responsible. In the formative educational period, when dental schools existed nowhere save in America, and when even dentistry itself was undefined, empirical, tentative, with no distinctive line of practice and no clearly prescribed curriculum of study, the newly adopted degree may have been conferred in some instances on insufficient acquirements. The experiment of establishing a special dental educational course of study, and thus laying the foundation for the broad profession which exists in all civilized countries to-day, was first tried in America, and here tested for the whole world. There were no precedents for our guidance, and no earlier successes or failures to stand as landmarks. We were the absolute pioneers, and it would be little wonder if we made some errors.

Since that day other countries have drawn professional lines, and marked out, each for itself, a distinctive course of procedure. Each of these somewhat varies from the others, and perhaps all from that originally established in America. If dentistry is to be

accepted as a profession at all, or as a distinct branch of a great mother profession, it must be broader than is any State; it cannot be confined by any bourne, nor limited by mountains, rivers, or oceans. There should be no American, English, German, or French dental profession, except as each is a part of one undivided whole. Realizing all this, the National Association of Dental Faculties was organized for, and has been constantly laboring to attain, these definite purposes:

First. To establish a broad and generally accepted curriculum of dental study, and by the combination of all the better dental schools of America to bring each up to a uniform standard of excellence.

Second. To establish a clear line of demarkation between the regular and the irregular schools, and to force out of existence the latter.

Third. Gradually to raise the standard of preliminary education until none but such as have the general erudition that should distinguish a professional man can be accepted in American dental colleges.

These were the principal objects in view, and in the attainment of them success has been secured exceeding the most sanguine expectations of the founders of the movement.

In the development of its plans the Association met with many obstacles, and found itself laboring under great embarrassments. One of the chief of these was the lack of information concerning professional affairs in foreign countries. The Association decided, so far as was in its power, to co-operate with the worthy dentists of other countries in the laying down of certain broad principles which must be the foundation upon which any true professional practice could rest. Any international co-operation must be based upon a complete knowledge by each of the methods and aims of the others. There can be no concurrent effort without mutual comprehension and intelligence.

Another perplexity was found in the fact that in establishing the preliminary qualifications for matriculation in American colleges there was no rule by which to judge of the value of certificates presented by foreign students. After completing the course of some foreign school, a student, who perhaps spoke only a strange language, sometimes desired to conclude his studies by taking as much of the American course as would enable him to finish it, and

he demanded of some American college advanced standing of one or more years. His certificates were in a foreign tongue, and in some instances were found either forged or not that which they were represented to be.

In this emergency, at the earnest request of certain American dentists practising in foreign countries, who had been scandalized by the acceptance in America of students with improper certificates, a committee, to be called the "Committee on Foreign Relations," was appointed, and was charged with certain definite duties:

First. It was to be in all things subordinate and subservient to the National Association of Dental Faculties, to which body it must make a full report each year.

Second. It was empowered to appoint advisory boards of not more than three members in each foreign country having any professional relations with America, whose reports concerning foreign qualifications might form a basis for action in this country.

Third. It was to have jurisdiction in all foreign educational questions affecting American dental colleges.

Fourth. It was to obtain definite information concerning dental regulations and laws in foreign countries; to learn what were the curriculum and requirements of all foreign dental schools, with the view of determining what value should, under American laws and regulations, be given their certificates of study, either as a qualification for dental practice in America or for admission to advanced standing in American dental colleges.

Fifth. It was charged with the duty of ferreting out institutions engaged in the granting of irregular degrees or degrees irregularly, and instituting measures for their suppression.

In compliance with the first enumerated duty your committee makes this report of what it has done during the past year, and appends the recommendations for future action which its experience leads it to believe advisable. It has earnestly striven to carry out what its members believed to be the wishes of this Association, and it has had no policy of its own to inaugurate or attempt to enforce. It has in all things been governed by what it believed to be the spirit of its instructions.

Concerning the second business with which it was charged, your committee begs to report that it has divided the various countries of both the eastern and western hemispheres into convenient groups, and has appointed boards for each, so far as the informa-

tion obtainable has warranted. In making such appointments it has deemed the following qualifications essential:

First. The appointee should be a regular and reputable dentist, possessing the legal qualifications of the country which he represents.

Second. He must be a graduate of some reputable American dental school, or possess an acquaintance with the curricula of American schools, and be familiar with American dental professional methods. The list of such appointments is appended for the approval of this Association.

In the discharge of the third duty imposed upon us your committee has met with great embarrassments. At the very outset colleges, members of this Association, appealed to us to know what consideration should be given to certificates showing that proposed students had taken the full course in schools located in Japan and Mexico, which purported to teach the whole dental curriculum. Your committee could not learn that any schools giving a course in dentistry that could be accepted as an equivalent for any part of that demanded by this Association existed in either country. They therefore ruled that students from either could only be accepted as members of the freshman class of American dental colleges, and only then if they complied with the rules of the Association so far as preliminary education and a knowledge of the English language are concerned. This ruling was cheerfully accepted by the schools that had raised the question, and we present it as an encouraging proof of the loyalty and anxious desire for a high standard that exists among the recognized dental colleges of America.

But the discussion of this raised the question of the consideration that should be given to the certificates of study from any foreign dental school. Our rules provide that no credit shall be given to certificates from any American dental school whose curriculum and regulations have not received the formal approval of this Association. Could we, in the name of the National Association of Dental Faculties, approve the giving of advanced standing to students from the schools of other countries that had not the same stamp of regularity? That is, could we extend to foreign and unknown dental teaching institutions privileges that were positively forbidden to American schools? And yet the responsibility of deciding this question had been thrust upon us by this Association, and we could not evade the obligation. It took but a short time to

arrive at the inevitable conclusion that we could not approve the giving of advanced standing to graduates or undergraduates of any foreign dental school whatever until such school had received the formal indorsement of this body.

Fortunately, few of these questions arose in time to affect any student for the term of 1899-1900. We informed the colleges presenting the cases that the matter would be referred to this annual meeting, and the committee is prepared to offer certain recommendations for the recognition of foreign schools, based upon such knowledge as we have been able to obtain. The whole matter is referred to this body for final adjustment.

In the discharge of the fourth duty that devolved upon us, your committee is in possession of a very voluminous mass of correspondence and reports, which it has earnestly labored to reduce to some system. The advisory boards appointed have, in a considerable number of instances, forwarded as full information concerning dental schools and the regulations governing dental practice in the countries represented by them as could be obtained, and it is upon such reports that the recommendations of your committee are wholly based. How much of them shall be given to the profession of America by publication must be decided by the Association. It would be quite impossible to print the great mass of correspondence unless a large volume should be devoted to that purpose.

Under the fifth head, your committee begs leave to report that a great deal has been accomplished. The same legal counsel employed last year has been retained, and the same general course has been pursued. It is probable that more fraudulent diplomas have been sold in foreign countries during the past year than ever before. This is due to the fact that those who have been carrying on the traffic realize that, because of activity in their prosecution, the time for accountability is near at hand, and they are striving to make the most of the present opportunity.

It is urged by foreigners that this business should be summarily stopped. Such people little know the difficulties in the way. In the first place, the traffic is mostly with foreigners. As their illegitimate diplomas are wholly worthless in this country, no State Board of Examiners recognizing them in any way, those who are engaged in the business carefully cover their tracks, and no responsible man can be located. Attempts to entrap them by means of decoy letters have failed, some such having crossed the ocean a number of times

without delivery, being forwarded from one of their foreign agents through whom the nefarious business is carried on to another, until finally returned to the writer by the post-office authorities. Fictitious names are signed to the pretended diplomas, so that it has been found almost impossible to fix the guilt upon any person. Our friends in foreign countries have contented themselves with bitter reproaches against American colleges generally, without forwarding any testimony that would assist in the discovery of the guilty ones. The fraudulent institutions could not by foreigners be distinguished from the regular colleges, for they were in possession of charters regularly granted under a vicious law of the State of Illinois, whose entire repeal it had been found impossible to secure, because the interests of legitimate enterprises were inextricably bound up with the illegitimate ones.

Your committee early discovered that working alone it could accomplish little. The Board of Health of the State of Illinois was taking the matter up, and they possessed advantages for the prosecution of the lawbreakers which were not within our reach. We have therefore contented ourselves with co-operating with that board in every way possible, and our counsel has been instructed to offer them any assistance within our power. As a consequence we have great pleasure in reporting that, acting under the United States law, which forbids the use of the mails for fraudulent purposes, the worst of these offenders have finally been apprehended and committed to jail in default of the heavy bail that was demanded. What is of more importance, if possible, the United States mails are closed against the transmission of their correspondence, and letters to or from them are promptly sequestered.

The greatest offender was last year named in this report as "The Independent Medical College of Chicago." We secured the annulment of the charter of this affair, but in a very short time we found that the same men were yet engaged in the business under the name of "The Cosmopolitan Medical College." They had offered for sale no less than thirty-six different diplomas in all the branches of science and art, and since the forfeiture of the charter under which they first worked it is believed they have sold more than a thousand fraudulent diplomas, at prices varying from ten to five hundred dollars each. Proof sufficient to secure the cancellation of the first charter was only obtained through the immediate expediency of

the man who was chiefly responsible. He paid a debt of some thirty dollars due to a stable-man, or hostler, by issuing a diploma to him and making him a professional man. The recipient, when he found himself under arrest for attempting practice under it, betrayed the swindler, and we were thus able to fix his guilt.

The late proceedings against this man and his associates have developed the fact that they were in possession of no less than *twenty-four* different charters, all regularly issued under that mischievous Illinois law, which was enacted for beneficent purposes. We have now learned the methods of these men, and it is believed that it will soon be possible to put an entire stop to their villanous traffic, through the imprisonment under the United States postal laws of those engaged in it. Too much credit cannot be given the Board of Health of the State of Illinois for the active part it has taken in the suppression of these miserable pretenders that have so long been bringing discredit upon our legitimate and excellent educational institutions.

In view of the fact that the other work of the Foreign Relations Committee is more than sufficient to engage all its surplus energies, and in further consideration that the work of the suppression of the fraudulent schools is now well in hand and the path for action fully defined, your committee recommends that this work be, for the future, placed in the hands of the Committee on Law, which shall receive the same instructions as those heretofore given the Committee on Foreign Relations.

The progress that this Association is making in its efforts to raise the status of professional teaching in our own country, to obtain a better appreciation of American professional affairs in foreign countries, and to maintain steady advancement towards a dental solidarity among all nations is very encouraging to every lover of humanity. It is true that even at home there may in uninformed circles yet be found some remnants of an unworthy professional jealousy, a failure to comprehend the real educational situation, and a tendency to attribute to our teachers motives unworthy any honest man. But the steady, persistent work of this Association in elevating the accepted standard just as fast as prudence permits, has wrought a great change in professional sentiment and immeasurably benefited the schools, and through them the profession at large. It only remains for us to continue this good work a few years longer to produce results that will be permanent

in their character, and so firmly established as henceforth to be self-sustaining.

REPORT CONCERNING FOREIGN EQUIVALENTS.

Your committee has very carefully considered a great mass of correspondence and many voluminous reports, and begs hereby to submit the conclusions which it has reached. It must not be forgotten that the system of dental instruction in Europe varies very widely from that of our special American dental schools. Instruction separate from that given in the medical schools or universities is very rare, and the practical training which forms a part of our curriculum is usually given by private preceptors.

Your committee does not feel at liberty to recommend the acceptance of an oral and theoretical course as the equivalent for one including practical work. We cannot believe that the certificates of private and irresponsible practitioners can by us be accepted as any part of a college course, and hence we have given them little consideration. It is quite probable that in some instances we have recommended that one year's advanced standing be given the holders of some certificates when further knowledge might show that they should be admitted to our senior classes, but we have thought it wisdom to err, if any mistakes are made, upon the safer side, as future action can readily correct any such errors.

Australia.

A very complete report from the various colonies of Australia and New Zealand has been made by the advisory board appointed for those countries. It would appear that in most of the colonies there is no dental legislation, but Victoria has lately secured a law analogous to that of England, and in Melbourne a dental school has been organized whose curriculum, from the partial syllabus furnished, seems to be a comparatively broad one. The dean of the "Australia College of Dentistry" is an American graduate, and he appears to have the confidence of the dentists of Australia.

Your committee is unable positively to determine whether the school in all respects comes up to our minimum requirements, but this it has directed its chairman definitely to ascertain, after which your committee will be prepared to recommend to this body some proper action. There has also been established in Melbourne, Province of Victoria, the "Dental College and Oral Hospital of

Victoria," but your committee is not at the present time in possession of sufficiently definite information to enable it to offer any recommendation concerning it.

In the provinces of Western Australia and Tasmania no dental legislation has been secured.

There is a dental law in New Zealand, and the member of the advisory board from that province has furnished your committee with an abstract of it. There are no dental schools in the province.

Switzerland.

Full reports from this country have been furnished by Dr. Bryan. It is a republic analogous to our own country in some respects, the federal union being composed of separate cantons. There are some excellent universities which offer certain facilities for dental study, but their practical instruction, we believe, cannot be accepted as an equivalent for that offered by American dental colleges. Your committee recommends that holders of the Swiss national diploma be given one year's advanced standing in the schools of this Association, but that no consideration be at present extended to holders of the cantonal qualifications.

Spain.

Complete reports have been furnished by members of the advisory board. The Spanish requirements in medicine are very high, but your committee cannot learn that there are any dental schools, or dental departments of universities, whose course of instruction can be accepted as the full equivalent for the instruction given in American dental colleges.

France.

Your committee is aware that separate dental schools exist in France, and its chairman has been in daily expectation of receiving their curriculum of study, but up to this time has been disappointed. Without this exact knowledge the members do not feel themselves justified in recommending any action, for we cannot proceed in so grave a matter upon mere assertions or impressions. As members of your committee will visit France in the immediate future, and will carefully investigate the course of study, we ask that we be given authority to incorporate our recommendations in this report after such investigation shall have been completed.

Germany and Austria.

The dental schools of these countries are departments of the universities, and only university students attend them. The instruction consists of lectures and clinical work given by from one to three dental professors, who lecture upon the different dental subjects. Instruction in chemistry and allied studies is afforded in the School of Philosophy or Science; in anatomy, physiology, etc., in the School of Medicine. No special instruction is given dental students except by the very few dental teachers. The clinical instruction is largely devoted to extraction and oral surgery. The practical work is usually quite limited. There is no obligatory course, but students enter for such lectures as they may choose, paying the fees of each professor separately. There are no obligatory hours for study or lectures.

The mechanical instruction consists of lectures on the principles of mechanics, the practical work being usually done in private laboratories. The examinations have very little resemblance to ours, each teacher asking three questions out of a list of forty approved by government. They are not usually as exhaustive or comprehensive or scrutinizing as ours. The licensing or approving power rests with the "Kultus Ministerium," or department of religion and education. The great majority of dentists in practice are Zahntechniker, —mechanical dentists,—upon whose work no restrictions are placed, as they are not recognized by the government.

Your committee recommends that students speaking the English language, who have taken the full dental course in German or Austrian universities, be eligible for reception in the junior classes of American dental colleges, provided it be shown that they have had at least two semesters of competent college instruction in practical laboratory and operative work. It further recommends that students speaking the English language who have had at least four semesters of such instruction in operative and prosthodontic practical courses, and who shall have finished the dental course in the University of Berlin, or in any German or Austrian dental school whose course of instruction offers a full equivalent, be eligible for admission to the senior classes of accepted American dental colleges.

Italy.

In Italy the practice of dentistry was long without special restrictions. Then an attendance upon lectures in a medical school was required, and a dental diploma was issued. In 1892 a law was passed which required dentists to obtain a medical diploma. This was not enforced until 1898, when a movement against foreign practitioners was inaugurated. They appealed to the courts and carried the matter to the supreme court, which decided that those in practice previous to 1888 had rights which could not be abrogated. At present the law of 1892 is in force, and this requires a medical diploma for the practice of dentistry and phlebotomy.

There are, we believe, no schools in Italy which have courses that can be accepted as equivalent to those of our American dental schools. The instruction given in the medical schools your committee believes to be too exclusively general in its character to form an acceptable course in dentistry for American students.

Mexico.

There is a medical school in the City of Mexico which purports to give dental instruction. Your committee cannot learn that it is of such a character as will enable it to be accepted as the equivalent for a course in an American college.

Japan.

There is one dental school in Japan,—that of Dr. Takayama, in Tokio. It confers no degree, but gives a certificate which entitles the holder to government examination, the same as if he had studied with some practising dentist. As the instruction is personal and the school is quite irresponsible, your committee believes that no consideration can be given to it.

Holland and Belgium.

In these countries the title of dentist is obtained by passing a practical examination in the theory and practice of dentistry. There are no separate dental schools, and we are not sufficiently informed of the comprehensiveness of the syllabi of the universities to offer any recommendations concerning them.

Great Britain.

There can be no questioning the fact that England has some excellent dental schools. The only embarrassing circumstance in

the determination of their status relative to ours lies in the great difference between the educational systems of the two countries. Undoubtedly they place greater stress upon preliminary educational requirements than do we, but your committee is of the opinion that our practical instruction is superior. Originally, we believe, there was little instruction given in prosthetic work during the term of attendance upon hospital lectures. Students were supposed to come to the college for didactic instruction, the practical part having been previously communicated by a preceptor. It should be comprehended that English dentists frequently employ a mechanic, who is not required to possess any special educational qualifications, the registered dentist mainly confining his attention to the operations of the surgery or operating-room.

In this country we believe the practical work of the laboratory should form a part of the college course, and we do not graduate a student until he shall have satisfactorily completed the whole curriculum within the college walls. We are under the impression that the English system is undergoing a change in this respect, and that practical laboratory work will soon form a part of the obligatory college course. We recommend that all students who shall have finished the complete course in any recognized English, Irish, or Scotch dental school or hospital shall be eligible for reception as senior students in American dental colleges upon proof of their having taken as a part of such course two years of instruction in a properly equipped dental laboratory and dental infirmary connected or affiliated with such dental school or hospital, and which requires the successful completion of the work deemed essential by recognized American schools, as formulated in the minimum requirements for foreign dental schools accompanying this report. We further recommend that for the present no consideration be given to partial courses in any of the dental schools of Great Britain.

Sweden.

Very complete reports have been furnished by the chairman of the advisory board, Dr. Forberg.

The country has one dental school, which is the dental department of the "Carolina Medico-Chirurgical Institute of Stockholm." Instruction is given by five professors of the medical department, and there are three dental professors, occupying respectively the chairs of dental surgery, operative dentistry, and

dental prosthetics and orthodontia. From the assurances given by Dr. Förberg, your committee believes that its graduates should be permitted to enter the second-year class of recognized American dental colleges, provided they shall have complied with our requirements concerning mechanical laboratory work.

Your committee has not sufficient knowledge concerning this school to warrant further recommendations at present.

Canada.

In the Dominion of Canada there is but one school which demands consideration, and that is a member of this body. Yet the educational systems of the two countries, especially in professional matters, are so different as to engender continual embarrassments. Canada being a foreign country, your committee has felt itself bound in duty to place it in the list of those countries whose relations with us must be taken into consideration. The dental educational system of Ontario approaches more nearly that of England than that of America. It has an analogous system of indentures which the dental student must sign, and private preceptorship forms a portion of its obligatory instruction.

This is directly at variance with our system, which accepts no tutorship by irresponsible parties. The dental law of Ontario forbids the entrance upon practice of any one who has not taken his final course of instruction in the Royal College of Dental Surgeons of Ontario. We believe that this principle is the correct one, and that the same rule should be made applicable in the United States, and that here, as there, no foreign qualification should be sufficient for registration in the various States of America. But the membership of this foreign school in our Association presents an embarrassment which for the present seems insuperable, and your committee therefore has no recommendation to make, but leaves the matter for future consideration in the hope that some code of international agreement may be devised which will give to the graduates of America's recognized colleges who desire to practise in Canada the same privileges extended to the alumni of the excellent Ontario dental college.

Concerning other foreign countries, your committee is not in possession of sufficiently definite information to warrant any action. We have no knowledge of the existence of any courses of instruction which can be accepted as an equivalent for courses in institu-

tions having membership in this body, and therefore advanced standing in our schools cannot in justice to our own students be granted, save in the instances above enumerated. The committee will gladly make use of any further information which may be furnished them, and will, in furtherance of the duty with which they are charged by this Association, embody such knowledge in future reports.

REPORT CONCERNING THE MINIMUM REQUIREMENTS TO BE DEMANDED BY THE NATIONAL ASSOCIATION OF DENTAL FACILITIES FOR THE RECOGNITION OF FOREIGN DENTAL SCHOOLS WHOSE STUDENTS DESIRE ADVANCED STANDING IN THE COLLEGES BELONGING TO THE ASSOCIATION.

1. The college must require of matriculants a preliminary education which is the full equivalent of that demanded by the schools of this Association.

2. The college must demand of students full attendance upon at least three full annual courses (not semesters) of lectures of not less than seven calendar months each, in separate years, covering all the studies proper to a full dental curriculum.

3. The college must possess a bacteriological laboratory, with sufficient of equipment for instruction in a competent course in bacteriology, which must form a part of its curriculum of study.

4. The same must be required in chemistry, histology, and pathology.

5. There must be a technic laboratory in which shall be taught the proper manipulations for the insertion of all kinds of fillings for teeth, the preparation and filling of the roots of teeth, the tempering and shaping of instruments, the drawing of wire and tubing for cases in orthodontia, and the cutting of belts and ovals.

6. There must be prosthetic laboratories sufficiently equipped for teaching all kinds of prosthetic work, and the construction of all the approved prosthetic appliances.

7. There must be a sufficiently equipped laboratory for instruction in making crowns and bridges, and the construction of appliances used in orthodontia.

8. There must be a properly equipped infirmary or surgery for the reception of patients, upon whom each and every student shall be required individually to perform all and enough of the operations necessary in dental practice thoroughly to qualify him for the successful pursuance of his profession.

9. Complete records of the work done by each student, of his attainments at sufficient and full examination in each subject of the curriculum of study, of his attendance and deportment during the course, must be permanently kept.

10. No credit must be allowed for any work not done under the immediate supervision of instructors connected with or especially approved by the college, and who are in direct affiliation with the faculty.

The following is a list of the countries for which advisory boards have been designated, and the appointments and nominations so far as made:

COUNTRY.	NAME.	COLLEGE.	POST-OFFICE ADDRESS.
Great Britain.	Wm. Mitchell, D.D.S.	Univ. of Michigan.	39 Upper Brooks Street, London, England.
Great Britain.	W. E. Royce, D.D.S.	Phil. Dental College.	2 Lonsdale Gardens, Tunbridge Wells, England.
Great Britain.	B. J. Bonnell.	.....	94 Cornwall Gardens, S. Kensington, London.
Holland and Belgium.	J. E. Grevers, D.D.S.	.....	13 Oude Turfmarkt, Am- sterdam, Holland.
Holland and Belgium.	Ed. Rosenthal, D.D.S.	Harvard Univ.	19 Boul. du Regent, Brussels, Belgium.
Holland and Belgium.	C. Van der Hoeven, D.D.S.	.....	Der Haag.
Denmark, Swe., & Nor'y.	Elof Förberg, D.D.S.	Phil. Dental College.	Sturegatan 24, Stock- holm, Sweden.
Denmark, Swe., & Nor'y.	S. S. Andersen, D.D.S.	Univ. Pennsylvania.	Christiana, Norway.
Denmark, Swe., & Nor'y.	L. P. Vorslund-Kjaer, D.D.S.	Phil. Dental College.	Copenhagen, Denmark.
Russia.	H. V. Wollison, D.D.S.	N. Y. Coll. Dent.	10 Quai de l'Amaranti, St. Petersburg, Russia.
Russia.	Theo. Weber, D.D.S.	N. Y. Coll. Dent.	Helsingfors, Finland.
Russia.	Geo. Th. Berger, D.D.S.	Phil. Dental Col. '77.	St. Petersburg, Russia.
Germany.	W. D. Miller, D.D.S.	Univ. Pennsylvania.	Victoriastrasse 30, Ber- lin, Germany.
Germany.	C. F. W. Bödecker, D.D.S.	N. Y. Coll. Dent.	55 Unter den Linden, Berlin, Germany.
Germany.	Friedrich Hesse, D.D.S.	N. Y. Coll. Dent.	Goethe Str. 6, Leipsig, Germany.
Austria and Hungary.	Dr. Szigmondi.	.....	.....
Austria and Hungary.	Dr. Waeisser.	.....	.....
Austria and Hungary.	Dr. Arkovy.	.....	.....
Italy and Greece.	Albert T. Webb, D.D.S.	Univ. Pennsylvania.	87 Via Nazionale, Rome, Italy.
Italy and Greece.	Tullio Avanzi.	.....	.....
Italy and Greece.	A. V. Elliott, D.D.S.	Univ. of Mich. '87.	10 Via Tornabuoni, Florence, Italy.
France.	J. H. Spaulding, D.D.S.	Univ. Minnesota.	39 Boul. Malesherbes, Paris, France.
France.	I. B. Davenport, M.D.	Coll. P. and S., New York.	30 Ave. de l'Opera, Paris, France.
France.	G. A. Roussell, D.D.S.	N. Y. Coll. Dent.	74 B'd Haussmann, Paris, France.

COUNTRY.	NAME.	COLLEGE.	Post-Office Address.
Spain and Portugal.	R. H. Portuondo, D.D.S.	Univ. Pennsylvania	Paseo de Recoletos 4, Madrid, Spain.
Spain and Portugal.	Floresan Aguilar, D.D.S.	Phil. Dental Coll.	Seviano 2, Madrid, Spain.
Spain and Portugal.	T. J. Thomas, D.D.S.		Billera, Spain.
Switzerland and Turkey.	L. C. Bryan, D.D.S.	Boston Dental Coll.	1 Stalmenberg, Basel, Switzerland.
Switzerland and Turkey.	Theo. Frick, D.D.S.	Univ. Pennsylvania	14 Tschallinstrasse Zurich, Switzerland.
Switzerland and Turkey.	Paul J. Guys, D.D.S.	Penn. Dental Coll.	11 Rue de Candolle, Geneva, Switzerland.
Japan, China, and India.	Louis Ottoly, D.D.S.	Western Dental Coll.	27 Main Street, Yokohama, Japan.
Japan, China, and India.	J. Ward Hall, D.D.S.		Shanghai, China.
Australia & New Zealand.	Alfred Burne, D.D.S.	Phil. Dental Coll.	1 Lyons Terrace, Liverpool Street, London.
Australia & New Zealand.	A. P. Merrill, D.D.S.	Phil. Dental Coll.	32 Collins Street, Melbourne.
Australia & New Zealand.	Herbert Cox, D.D.S.	Univ. of Michigan.	116 Queen Street, Auckland, New Zealand.
Cuba & W. India Islands.			
Cuba & W. India Islands.	Rice R. Buchanan, D.D.S.		6 San Francisco Street, San Juan, Porto Rico.
Cuba & W. India Islands.			
Mexico & Cent. America.			
Mexico & Cent. America.			
Mexico & Cent. America.			
Venez. Colon, & Ecua'r			
Venez. Colon, & Ecua'r			
Venez. Colon, & Ecua'r			
Peru, Bolivia, and Chili.	S. R. Salazar, D.D.S.	Chicago Coll. Dental Surgery.	Lima, Peru.
Peru, Bolivia, and Chili.			
Peru, Bolivia, and Chili.			
Brazil and Guiana.			
Brazil and Guiana.			
Brazil and Guiana.			
Argentine, Para. & Uru.			
Argentine, Para. & Uru.			
Argentine, Para. & Uru.			

W. C. BARRETT, *Chairman.*

208 Franklin Street, Buffalo, N. Y.

S. H. GUILFORD,

1725 Chestnut Street, Philadelphia, Pa.

J. D. PATTERSON,

Ninth and Walnut Streets, Kansas City, Mo.

T. W. BEOPHY,

126 State Street, Chicago, Ill.

H. W. MORGAN,

211 N. High Street, Nashville, Tenn.

Foreign Relations Committee.

ALUMNI OF HARVARD DENTAL SCHOOL.

DR. EDWARD C. BRIGGS read a paper entitled "Some of the Nerve Remedies."

(For Dr. Briggs's paper, see page 659.)

DISCUSSION.

Dr. Gillett.—I have used some of the drugs Dr. Briggs has mentioned, and have sometimes been helped over hard places by the use of the coal-tar products.

Antikamnia and ammonol are often serviceable in quieting the patient who must go through severe suffering with abscesses or other inflammatory conditions. I think antikamnia has served me better than the ammonol.

Orthoform, a comparatively new local anæsthetic, has served me well in some cases for relieving pain after operations. The orthoform powder dusted over the surface of a wound will often give relief from pain for twenty-four to forty-eight hours. After the extraction of third molars, where there has been laceration and bruising of the tissues, it is a very satisfactory application. Orthoform dissolves very slowly, which fact probably accounts for its prolonged anæsthetic effect.

Nervanin is closely related to orthoform, and is intended for hypodermic use, but I have been waiting for more extended reports before making use of it.

Dr. Kelley.—I have used orthoform very successfully. I have also had a great deal of experience with antikamnia, and have great faith in it, although I seem to get very poor results from it. In the terrible pain which occurs after the extraction of teeth, I find orthoform placed in the socket very successful.

I would like information in regard to an extremely unfortunate case which I have at present. A young lady, about twenty-two or twenty-three years of age, has lost within the last year and a half seventeen teeth, sixteen before she came under my care. All were extracted on account of extreme pain. She came to me with the seventeenth, and I have lost that. The pain seemed to start with a tooth so nearly perfect that I could not easily discover anything the matter with it; only after a very careful examination I discovered a small cavity which had been filled with gutta-percha. She has had a very skilful dentist, but nothing seems to give relief.

The trouble goes from the right side to the left and from the upper to the lower jaw; from the back of the mouth to the front. She has not lost any of her front teeth, but she constantly fears that possibility. I decided, after an examination of the tooth under my care, to destroy the pulp. I filled the root-canal, but as soon as my instrument went through the apical foramen a terrible pain started up. This continued steadily, and all the drugs just mentioned could not stop it. I do not remember just what I used, but I should say about everything, and I had, of course, taken out my root-filling. She went home and to bed, and three or four days afterwards her family physician extracted the tooth.

Dr. Briggs.—You did not see the tooth when it came out?

Dr. Kelley.—Yes, I saw the tooth. There was a little inflammation of the pericementum. It had been perfectly cleaned out, root perfectly filled down to the apex, and everything looked all right.

Dr. Briggs.—Did you see whether the pain was caused by the formation of pulp-stone or decalcifying of the tooth? This pain is due to the presence of the pulp, and as long as the patient's general health is depreciated, such conditions are liable to occur. I should be ready to spring very quickly to any tooth that showed any signs of decay, destroy the pulp, and fill it immediately. I should be very quick to act the minute any tooth was suspected of decay.

Dr. Kelley.—The pain seemed to start the moment I got down to the end of the root.

Dr. Briggs.—Whatever the condition was, you simply started up the seat of the trouble. Probably if you could have controlled that one attack, you would not have had another one.

Dr. Kelley.—I thought possibly the girl could not stand the pain resulting from the root-filling, although she seemed to be very courageous, and she certainly was called upon to stand a great deal. However, I feel it is the loss of physical and nerve force that is more the cause of unsuccessful treatment than any other one thing. It seems to be a case where the patient is panic-stricken.

Editorial.

THE SEASON FOR RENEWED EFFORT.

IN this country, owing to climatic influences, there is a season of activity and one that nearly borders on stagnation, a period beginning with June and ending with September. That this follows laws of cause and effect is quite true, having no special relation to man and his needs. It is, however, equally true that but for this period of repose the nervous activities engendered by these conditions would wear out the strongest organization. While all business languishes during this hot period, it is a time well adapted for reflection and the formation of plans for the approaching active season.

The period of partial repose of all the activities, mental and physical, is usually the one selected by the dental fraternity to hold the national and State conventions. That this selection of time is open to criticism needs no argument, but it will, probably, remain as originally selected for years to come. It must be apparent that an earlier period in the year—May or early June—would be productive of greater results. Calling men together with the thermometer ranging from 80° to 95° F. is not conducive to the display of superior mental ability. The effect of this was manifest at all the conventions held during this hot summer. It is, however, useless to expect any change, for those who feel it a duty and a pleasure to attend these meetings will rather bear the physical torture than the loss of practice at a more comfortable period. While this is, apparently, a finality in the dentistry of this country, it may be left where it remains and attention be given to problems more difficult of solution.

The general convention period having closed, the interest will soon be awakened to the work of the local societies. These are the true sources of dental progress. The national and State organizations broaden social professional life, but they add little to the sum of general dental knowledge. This must, necessarily, have its source, first, in individuals, and then from these to local societies. When the work of the latter bodies is compared with that

of the National Dental Association, the latter suffers by comparison. This should be expected, as the individual is in closer touch with the local body and receives his enthusiasm for work from this more nearly organized effort.

This brings up the thought and the question, Is there a sufficiently well devised plan as a basis for work in these local organizations? In looking over the subjects brought before these societies, the mind is impressed with the fact that papers are written and accepted without much attention being paid to their intrinsic value. The object of the Society Committee seems to be to secure a programme, very often regardless of quality. The result is, therefore, of little value from a scientific stand-point. It is a waste of time to thresh over old subjects, and it is wearisome to read of "Methods of Filling Teeth," "The Value of Soft-gold as compared with Cohesive," "The Treatment of Pulp-Canals," etc., etc. If the dental profession has not been able to settle these questions through an experience of a century of work, they might be left until it reaches a period when some minds will rise beyond rudimentary thought and give a clear and positive answer to conflicting theories. These questions have, however, long ago been practically settled, but the rising generation of dentists will not have it so, and, ignoring the experience of the past, persist in burdening societies with their crude conceptions of what ought to be legitimate practice. It must not be thought that objection is made to the thorough consideration of matters connected with the subjects named and that of many others. There is a way that leads to truth, and there is another that confirms ignorance. If a paper shows that the author has experimented days and months to find a better way to practise, he is entitled to a respectful hearing; but he is bound to demonstrate that he is at the same time familiar with all that has preceded his effort in the history of dentistry.

The National Dental Association has started in the right direction to secure better results, and the outcome will be looked for with interest. Whether it accomplishes much or little, it should still be an example for local organizations to follow. The older dental societies did much better than many at present. When a problem for solution was presented, it was usual to select a committee of the best and most original workers to examine the subject thoroughly and report. Within the writer's knowledge some of these spent months in careful work. In this way the Pennsylv-

vania Association of Dental Surgeons settled two very important questions,—first, as to the value of “sponge gold” as a filling-material, and, second, whether free mercury existed in rubber plates, resulting in an inflamed mucous membrane. The conclusion in regard to sponge gold, which covers practically all the more recent forms, has never been successfully disputed, and the latter subject was so thoroughly examined, chemically and microscopically, that the last word was said then and there in regard to mercury producing the pathological condition named. It was left, however, for Dr. Black to furnish the key that opened the door to a final escape from this troublesome feature in this class of dentures.

These facts are simply illustrative of the true in opposition to the false method. The one seeks to know, while the other assumes to know. The one laboriously gropes for knowledge, step by step, while the other takes up the pen and theorizes, brilliantly, it may be, on paper. Societies need the former method. It is feared, however, that the same wearisome platitudinous round of words will be continued unless societies use different methods than those at present in vogue. It will be uplifting if in the near future some dental organization will begin a year in advance to portion out unsolved problems to be reported upon when a sufficient number of facts have been obtained to furnish a basis for conclusions.

It is noted with pleasure that individual work in original investigation has been steadily growing the past few years, doubtless due to that higher training given in all the dental schools. Young men are receiving an incentive for future usefulness, and it is to be hoped that the objectionable essay alluded to will soon become a thing of the past.

Whether this winter, or winters succeeding, will show a change in method in society work, the trend of thought and practice is all pointing in the direction outlined, and we may expect in the not far distant future that papers will be made up from observed facts, and discussions will be limited to the subject of the essay, a condition of affairs most earnestly desired by all who prefer truth to theory, and condensed thought to a multiplication of words.

TO THE EDITOR OF THE "DENTAL REGISTER."

THE editor of this journal desires to express his thanks to the editor of the *Dental Register* for his editorial in the July number, in which he undertakes to give the views of the editor of this journal as he, the editor, understood them from reading a leading article in the July number of the INTERNATIONAL DENTAL JOURNAL, entitled "Is Dentistry drifting into Medicine?" If the editor of the *Register* failed to understand the underlying thought of the editorial in question, it must certainly be true that the writer failed to clearly convey his meaning to the average reader.

The editor of the INTERNATIONAL is, however, inclined to think that our friend failed to grasp either the editorial or the facts that it endeavored to elucidate. To sustain his conclusion he quotes one paragraph that "Dental education has been gradually tending towards the medical degree for the past thirty years, and those who have watched the trend of thought have long since come to the conclusion that at no distant period dentistry would be merged into medicine, and that the dentist of the future would practise as a specialist under the one general title of Doctor of Medicine." The editor then follows this with the statement, "A comparison of the curriculum of to-day with that of thirty years ago will show that little has been added of medical technique, while great additions have been made along the line of the medical sciences, scarcely anything in the way of clinical or practical medicine."

The truth of this must be admitted, and directly supports the thought of the writer that this continued advance must certainly and surely lead to the medical degree. There is no escape from the facts of evolutionary progress.

The editor assumes that the writer was so impressed, at the recent meeting of the Section of Stomatology, American Medical Association, with "the profound conclusions of those eminent medical specialists and experienced dental practitioners and educators," that he at once jumped to the conclusion "that the ideal of dental education must eventually be the degree of Doctor of Medicine." Had our friend followed the article carefully he would have found the following: "Educators of experience accept these changes with hesitation and doubt. They cannot avoid the conclusion that the practical side of dentistry has suffered and will

continue to suffer in proportion as the curriculum is extended at the top. Like an inverted pyramid it must eventually fall by its own weight." The truth is, the writer was not unduly impressed with the arguments advanced at that meeting, well expressed as they were, but has for years seen, as he stated, that the general trend of dental education has been in the direction of the medical degree.

The question is not one of personal preference. If that were to be the standard of judgment, the writer would decidedly be on the side of continuing dentistry as a distinct profession. In fact, the possibility of dentistry being eventually absorbed into medicine creates a feeling of decided antagonism, but the question is one so broad that it dwarfs mere personality, and necessitates an intelligent outlook and a careful weighing of facts that have led step by step, nearer and nearer, to the point when its consideration will be forced upon the higher dental schools. We simply request our friend and coworker to enlarge his vision, and perhaps, whether willingly or unwillingly, he will reach similar conclusions.

DENTISTRY FOLLOWS THE FLAG.

It is a recognized fact that the school-house follows American civilization. When the pioneer has cleared the forest and prairie, his second thought is to educate his children, and the school-house is built. It was left for recent years to demonstrate that the dental practitioner follows the school-house.

While Congress is discussing, without apparent end, the advisability of having dentists in the army, dentists have not waited for red tape and prejudice, but have quietly advanced with the army, and we find them taking their place in the recently acquired possessions of the United States.

The following programme lies on our desk, and so distinctly represents the character of American dental practitioners that it is deemed worthy a prominent place on our pages. It is as follows:

MANILA DENTAL SOCIETY.

(Organized February 4, 1900.)

OFFICERS FOR 1900-1901.

President	Frank R. Harkinson.
Vice-President	Juan Arévalo.
Secretary	Lloyd R. Hawley.
Treasurer	R. L. Hale.

The Society meets on the second Monday of each month (except July and August), at 8 p.m. Legal dental practitioners in the Philippine Islands are eligible to membership. Resident physicians and visiting dentists are always cordially welcome.

PROGRAMME FOR 1900-1901.

1900.

March 12.—Paper by Dr. Louis Ottofy, "Observations on the Practice of Dentistry in the Philippines."

April 2.—General Discussion. Incidents of Office Practice.

May 14.—General Discussion. Incidents of Office Practice.

June 11.—Paper by Dr. W. B. Skidmore, "Dental Laws and Dental Legislation in the Philippines."

September 10.—Paper by Dr. Lloyd R. Hawley, "Pyorrhea Alveolaris."

October 8.—Paper by Dr. R. L. Hale, "Gold Filling."

November 12.—Paper by Dr. E. B. Merchant, "Crown- and Bridge-Work."

December 10.—Paper by Dr. Juan Arévalo, "History of Dentistry in the Philippines."

1901.

January 14.—Paper by Dr. Anna M. Sawyer, "Amalgam Filling."

February 11.—Annual Address by the President, Dr. Frank R. Harkinson. Annual Meeting, Election of Officers, Reports, etc.

It will be observed that all arrangements for a well-ordered society is in this programme, and it reflects credit upon the representatives of dentistry in this distant region. Some of the names have a familiar sound. The "eternal feminine" is among them.

Thirty-four years ago the writer advocated, in a public address, the admission of woman into dentistry. In the comparatively brief period since, woman has made herself felt in dentistry in all portions of advanced civilization, and now we find her at work in the Philippines, long before the United States Commission has succeeded in convincing the natives that the principles of the American republic would be to their interest to adopt.

The congratulations of the INTERNATIONAL DENTAL JOURNAL are extended to the Manila Dental Society.

REPORT OF FOREIGN RELATIONS COMMITTEE.

CONSIDERABLE space is given in this number to the report of this committee. It is interesting and, while open to criticism in some points, exhibits an earnest effort in the right direction.

There is a mistake in the statement that it "was adopted" at the National Association of Dental Faculties. If that were the motion, as originally made, it was a parliamentary error. The foundation rule of the Association is that all motions, resolutions, or reports affecting colleges must lie over for one year before final action. There are a number of suggestions in this report that affect the interests of a number of the colleges, members of the Association, hence the report could not be and was not adopted. It can be taken up next year at the meeting in Milwaukee, and considered in detail, but until this is done and the official report received, members of the Association and the foreign advisory committees cannot be required to consider it in their rulings.

Notes and Comments.¹

WHAT THE DENTAL DEGREE STANDS FOR.—From Dr. TROUBAN's timely editorial in the July JOURNAL we reproduce the following paragraph to give it additional emphasis:

"Dentistry has no reason to beg for recognition. Such a demand is always an indication of partial culture. Dentistry has a position secured by long years of patient work. It has demonstrated that the oral cavity contains within its borders sufficient to occupy the best thought for a lifetime of those who practise therein. It has proved to the doctors of medicine that for uncounted centuries they have neglected the principal source of disease, and that this neglect, to their discredit, still continues. It has proved that the pathological conditions of this cavity hold intimate relations with the general organization, and are a source of continued infection. It has proved that it has been possible to lessen the terrors of old age and prolong the period of life, and to make that period one of comparative comfort; and, finally, it has forced the respect of the men who treated it in the past with contempt, and they have been obliged, however unwillingly, to believe that the time has come when the partial degrees in dentistry should be abandoned."

HEADACHES FROM ALVEOLAR FISTULAS.—In a paper contributed to the *Pacific Dental Gazette* Dr. A. C. HART says,—

"Patients often present themselves suffering with, as they term it, nervous headaches which have entirely disappeared on the closing up of one or more of these fatalous tracts. The constant drain upon the system, together with the physical effects upon some extremely sensitive and nervous patient, to whom this discharge of pus becomes a source of dread and apprehension of what

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1114 Walnut Street, Philadelphia.

may result if this opening is not closed, is of sufficient importance to emphasize the need of closing these openings.”

WHAT DOES IT PROFIT?—It is often urged, says Dr. W. C. Barrett, that modern investigation and discovery has availed man little, and that all our knowledge of the microscopical world has not materially benefited the human race. We are told that the demonstration by Miller that dental caries is due to bacterial agency has not prevented the decay of teeth, nor lessened the demand for the service of the dentist. But it has armed him with new weapons, and enabled him better to meet the ravages of disease. The dentist can save teeth better now than he could even a decade ago, and he who best comprehends the discoveries of Miller can best save teeth.

SHOULD FORMALIN BE USED FOR DENTAL PURPOSES?—Dr. A. H. Peck, of Chicago, before the Illinois State Dental Society, said,—“Having seen a number of cases that have been treated by physicians with various per cent. solutions of formalin in which more or less sloughing of the soft parts has resulted,—one which I saw not long since in which as low as a two per cent. solution was used, in connection with which considerable sloughing resulted,—and also because of the very vivid recollections of my own personal experiences with it, I have come to the conclusion that we should get along without it in the treatment of diseased conditions about the mouth.”

ANOTHER CASE OF COCAINE POISONING.—Dr. A. W. Harlan, in writing upon the subject, says,—

“Recently while getting ready to set a crown on the root of a central incisor, we placed a mat of paper about the size of a copper cent on the gum, saturated with a four per cent. solution of hydrochlorate of cocaine, and in about five minutes the patient was poisoned. She became limp and was not conscious of anything for four hours. It was with difficulty that she was made to walk, and she talked incessantly and incoherently.

"She was given one nitrite of amyl pearl and was made to inhale stronger ammonia and was given five cups of strong black coffee. The quantity of the solution used was about four minims, some of which was undoubtedly swallowed. The recovery was sudden and complete after four hours of incessant labor. No after-effects except some distress in the stomach on account of the large quantity of coffee. The next day she did not remember anything that occurred from the time she sat down in the chair until she was taken to the train to go home."

"CHANGES IN THE WEATHER INCREASES PATRONAGE."—In an interesting paper read before the Northern Ohio Dental Society, and published in the *Ohio Dental Journal*, Dr. Florence M. Taylor says that a change in the weather frequently causes trouble with the teeth; in other words, increases patronage. People often come, the doctor says, with a history of getting their feet wet. There is something about catching cold that predisposes to or causes periodontitis. A tooth that the patient knows needs filling is neglected because it does not cause any inconvenience, until he or she is caught in a storm or exposed to a draught, and then there is trouble. It may be nothing more than a congestion that counter-irritation or blood-letting will relieve. But the usual history after these attacks is that they return unless the tooth receives proper attention, and sooner or later an abscess is formed.

TRICHLOROACETIC ACID FOR FISTULA FROM ALVEOLAR ABSCESS.—For the treatment of a chronic fistula Dr. J. S. Ashbrook, in the *Dental Brief*, suggests the use of trichloroacetic acid. With cotton carefully placed around a Donaldson broach, saturated with the acid, he says you can reach the bottom, and in most cases the fistula disappears after two applications. In all cases he uses the pure acid, in small quantities. In forty-eight hours all traces of its action has gone, except the good results; the mucous membrane peeling off, as it were, and a new layer forming.

UNJUST CRITICISM.—Dr. L. P. Bethel says editorially in the *Ohio Journal*, "This spirit of criticism is too common. Simply

because one man's methods may differ from yours is not cause for criticism and condemnation, for it may bring the same results and be as much easier for him as your method is for you. We are inclined to think that much of this criticism comes from immature thought, and often some petty jealousy or dislike seems to give rise to it.

"Recently in a dental meeting one member said, 'Dentists are the greatest braggarts on earth, etc.' He means you, all of you. Is not this a strong statement? It is true that we have some who are given to boasting, but these men soon find their level. Where we have one of this kind we have hundreds who tower above self-praise; men whose qualifications and attainments stamp them as superior without telling the world of their ability. That man is looked upon as mediocre who is continually telling of his great accomplishments. Why, then, should this remark be thrust at the whole profession? Is it just?"

ARTIFICIAL CARIES.—"I have just succeeded," writes Dr. S. A. Hopkins, "in producing artificial caries with a pure culture of the *bacillus mesentericus vulgatis*. The media was one per cent. glucose bouillon, and the time was nine months. There are many other forms, probably, that will do the same, and it will now be much easier to work them out. I believe this is the first *authentic* instance where decay has been produced by pure cultures of mouth bacteria, and I feel that it is an important step in advance. There is no secret about it. I should only be glad to find others working in the same line."

PREPARATION OF STEEL FOR REGULATING APPLIANCES.—Dr. Genese, in the *Ohio Dental Journal*, says, after the steel appliance has been given the desired shape, it should be steeped in chloride of zinc, and then in pure molten tin. No oxidation will then take place; its tension is improved, and it can be united to any other metal by pure tin, using the chloride of zinc as a flux. If embedded in vulcanite it will not cause disintegration.

THE

International Dental Journal.

VOL. XXI.

NOVEMBER, 1900.

No. 11

Original Communications.¹

THE DENTIST AND HIS ASSOCIATES²

BY CHARLES OTIS KIMBALL, A.B., M.D., NEW YORK CITY.

WHEN, as Bryant says,

"The melancholy days are come, the saddest of the year,
Of wailing winds and naked woods and meadows brown and sore;
Heaped in the hollows of the grove the autumn leaves lie dead,
They rustle to the eddying gust and to the rabbit's tread."

and we note the changing season, it is not strange if our thoughts take on a tinge of sadness as we remember that "we all do fade as a leaf." But there is another lesson drawn from the crimson leaf wavering down in the mellow air, that turns our thoughts from the vanishing past to the advancing future. For as each leaf falls reluctantly from the twig where it has hung the summer through to find its final rest, its life-work done, a tiny bud giving promise of a new year's verdure is revealed by the loosening stem.

Science says, "No life without a life," and looks backward to see whence it came. Faith says, "Every life for life," and looking

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claims to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, June 8, 1900.

forward sees in the future the meaning and value of the present. It is by no mere chance that a mother gives her life for her child, it may be in one agony of surrender, or more often, minute by minute through long years, sacrificing her life for his, for under mother and child, leaf and bud, is Nature's fundamental law, that each individual prepares the way for and helps on his successor.

I am here to-night to speak of one phase of this great law. To plead for continuity of life, not merely physical, but that higher life of intelligent and persistent effort in following out an idea, which is the meaning of every profession.

We have lately listened to a helpful paper upon "The Successful Dentist," which showed how essential to true success is soundness of character and earnestness of purpose; how well-directed efforts stimulated by love for pre-eminence, desire for ampler compensation, and a sincere wish to help others, achieve a degree of knowledge, skill, and delicacy of touch, which combined with patience, gentleness, and sympathy for patients win a confidence firm and abiding.

My theme, symbolized by the hand passing a torch, is that one life finds its fullest development in transmitting life, only as we give do we live; so it carries the thought of the essayist one step farther. "The Successful Dentist," as he takes a thoughtful view of his life and its experiences, as he thinks of all he has received from the past, all he has acquired in the present by careful observation and patient self-forgetful work, using the faculties given to him, must feel that this fund of learning, observation, experience, and skill is a great talent intrusted to him by no accident, but of purpose (call it what you will, it seems to me divine), which should not only be used to the full, but in some way transmitted as a sacred trust to help and uplift other lives,—he must pass the torch,—and the question arises, How may such a professional life be best transmitted?

As the years go by each wise decision or skilful effort makes its deepening impression on the brain of the dentist himself, fitting him for still better work and more accurate judgment; besides, since he is not working upon mere matter, but upon observing and thinking creatures, who find that they are helped by his efforts, he is training their minds into a habit of confidence in him, which deepens and broadens with every such experience, depending rather

upon the expression of his character than upon their accurate knowledge of what he is doing. This confidence becomes a part of his funded increment of life, his capital. How can he make use of it to enlarge his sphere of usefulness beyond the working power of one pair of hands?

By a subtle law of sympathy confidence is communicated from one to another, and so a practice grows till it fills his life full and he goes on rejoicing in his strength, like a skilled fencer, with conscious delight in each difficulty mastered. He is strong and elastic, still capable of his best work, but the years are telling upon him, and possibly a little something of his youthful enthusiasm has gone, though the work to be done is ever growing in amount, till the ascending curve of judgment and experience is crossed by the descending curve of physical strength, while the calls upon that judgment and experience are increasing.

"Till at length the burden seems
Greater than our strength can bear,
Heavy as the weight of dreams
Pressing on us everywhere."

How, then, can this situation be met as the work becomes too great for him?

Moreover, as his experience lengthens and his judgment matures he acquires a quickness of perception, a power of seeing through a difficult situation, a clearness in diagnosis, which becomes valuable. In a moment's time he can advise or suggest courses of action which may take hours or months for completion; his mental power has outgrown his physical powers, he can plan more than he can possibly execute alone, while his judgment becomes nearly unfailing. This is the crowning glory of a professional life, this makes a man a consultant, when his advice is sought not by patients merely but by his fellow-craftsmen. How can a man best use this experience and judgment to help his professional brethren?

Aside from these various considerations, most of which bear more or less upon his natural desire for his own gain, there is an unselfish side of the question. For there are many patients endeared to him by long friendship whose means will not allow them to pay his prices, yet his time is full at the higher rate. What a relief to him and what a comfort to them to have some one who

can take up his work, carrying it on to a fuller perfection in complete sympathy with him and faithfulness to them; to whom he can intrust them, and while watching and advising, feel that he still holds them in his care even if they are not served by his own hands! How can he do this?

Allow me to repeat these questions that I have raised: 1. How can a dentist best transmit his professional life? 2. How can he utilize as part of his capital his patients' confidence? 3. How can he be relieved from the overpressure of a practice too large? 4. How can he use his acquired judgment and experience with the best result? 5. How can he best help his old patients when unable personally to serve them? One answer fits them all: by selecting, training, retaining, and advising an associate.

Let us consider this answer under four heads: 1. The associate,—how to choose him. 2. What are his needs? 3. What should characterize the relation between dentist and associate. 4. By what methods can this relation be sustained?

As I look around I see before me the men who have been in my mind as I have tried to picture the successful dentist in his duties as well as his needs, and if you will allow me I will change the person and speak directly to you as representing "The Successful Dentist" needing an associate.

1. THE ASSOCIATE.

A wise lawyer once said that next in importance to choosing a wife came the selection of a business partner. Hence in any thought of close association with another the most important thing to be considered is the man himself, the real man, his character, the mint-mark by which he is reckoned in the sum of life, for you are not merely teaching a student who may go away, but you are planning for a friend who shall be like a son to you, and who should fairly reflect every gift and grace you yourself may possess.

You must seek for truth, honesty, faithfulness, perseverance, courage, self-confidence, self-forgetfulness, a high sense of honor, and reverence for womanhood, these elements of character, like the facets of a cut gem, lead the eye to it and reveal its beauty. Next to these come his personal habits, for the dentist more than any other professional man is brought continually into the closest intimate personal contact with his patients. Hence he should have cleanness of thought and speech, chasteness of life, neatness of

person and clothing, sweetness of breath, always suggesting physical and moral purity. And then giving vitality to all these, making them effective, note his purpose in life,—is it deep and true? has he lighted that lamp of sacrifice which alone can show the way along the path of duty? is he ready to devote his life faithfully to his profession? Such men there are,—they are worth seeking long for.

Nor are these the only things to be considered; you must seek for a good appearance, ease of manner and address, courteous and affable ways, obligingness, punctuality, promptness, for these will all tell in his work. Then as to his ability or rather adaptability to the special work before him, is he handy with tools, accustomed to nicety of execution? can he see straight and work to a finish? And you may well ask, What are his amusements and interests outside of his work? What has been his general education, is it such as barely suffices to pass his Regents' examinations, or such as shall put him on a par with the doctors and lawyers and ministers of the community,—viz., a good college education? can he think and speak clearly and intelligently? is his language good, so that he is at home with the best-educated men and women? Lastly, how careful has been his professional training? You must seek to have his preparation as thorough or more so than your own. You must bear in mind that his life is to be the standard of the profession in days to come, therefore must see to it that he lays a broad and deep foundation. He should have studied medicine as a basis on which to build his special study and training as a dentist, in this way your personal influence will directly tend towards raising the general standard of the profession.

2. HIS NEEDS.

Let us now consider what such a young man just graduating from a dental school needs upon his entry into active professional life. In the first place, he needs opportunity for constant practice in operating under your eye and direction till the most delicate and difficult operations are certain in his hands; this practice he cannot get in any dental school of which I am aware. They must teach theory with some practice; your office should be a post-graduate school where he will reduce his theories to perfect practice under your trained and watchful eye. Every operation should be criticised kindly and fairly but unsparingly till his standard of per-

fection in work comes up to your own, and this repeated, showing him the reasons, till his own standard of criticism is as high as yours.

Then in like way he needs criticism upon his judgments in order to train his judgment. Judgment is based largely upon one's own experience, to a less degree upon that of others. He is young, has had little or no experience upon which to base a sound judgment. Your long experience should be at his service, recalling observations of similar cases, pointing out the far-away results of operations, calling attention to minute diagnostic signs, and so putting him in the way of making wise decisions. These should be referred to you for confirmation, till gradually he learns to decide just as clearly and accurately as you do. Thus his judgment is trained to wise and independent action. Meanwhile, it is backed up by the weight of your authority strengthening his patients' confidence in him. In the simple cases of every-day practice he soon learns to decide wisely and act promptly, but even this responsibility is assumed gradually, while in the doubtful and puzzling cases where he is not quite sure of himself, he leans upon you as a rock, till time and experience fit him in turn to be a supporter to others. In these difficult cases every young practitioner needs a chance for ready consultation. His patient is in the chair, something must be done immediately, and many a time (especially at the first) your suggestion will come to him as a great relief, not only giving him an outline to work to, but perhaps putting the clue to the whole situation in his hands. He needs also your encouragement in study and research, in thinking for himself that he may grow in wisdom. A hint dropped now and then, a leading question, a problem given for solution, these will stimulate his mind and lead to a fuller development of all his powers.

3. THE RELATION.

Now, what shall be the nature of the relation between you and your associate, chosen so carefully and needing so much? First, it must be *as just to him* as to you. His life-work is before him, and the growth of a personal independent practice which shall be his own must be clearly contemplated from the start. Much of his practice will come by the inevitable growth pertaining to faithful work of which we have already spoken, and only a small part will be received directly from you. But if he is such a man as he

should be, and trained as you should train him, you should take pains to see that he is introduced in your best families, till he is known as one whom you trust and upon whom they may safely rely. The relation must be cordial and friendly; he must feel that you are interested in his success, and indeed that you are in full sympathy with all his life. Your advice in other things than mere professional matters will be sought for and valued, and so your own personality will be impressed upon him, and his gold will bear the stamp of your character.

Second, it must also be a relation for some time. Clearly the advantages we have spoken of cannot be realized in a moment, nor even in a few months. Years alone can give opportunity for the growth and development of that which is good in professional life.

Lastly, it must be progressive. Your associate comes as a pupil, he takes your directions and suggestions implicitly at first, but as time goes on and his judgment matures he will hold opinions which are now his own, worked out by his own observation and thought. Your judgment will sometimes be questioned, and you must not feel hurt or vexed; he is growing, and his place in the world will not be fulfilled till he can stand strongly and steadily alone. So gradually from pupil, assistant, associate, he comes to be your friend; possibly partner in your work, but now recognized as your equal in professional dignity, and ready to uphold the standard of excellence you have raised.

4. METHODS.

How can these relations between you and your associate be best realized? Three plans come to my mind. First, you may hire him, paying him a salary for his work and receiving all returns. Second, you may admit him to a share in your practice, paying him a percentage. Third, you may help to build up an independent practice for him, receiving a percentage from him.

The first plan, paying a salary, lacks the element of permanence, still more fatal is the fact that there is in it no natural growth of an independent practice for him, so there is less incentive to doing his best work.

The second plan, sharing in your practice, is that commonly used by physicians, and there has shown its value, but in dentistry, where so much depends upon the individual touch and workmanship, the division of responsibility can hardly work well in the

long run, nor will a natural growth of character take place so surely.

The third plan, building up a new practice, seems upon the whole best adapted to bring out all there is good in the younger man, and make available all that is wise and helpful in the older one. This plan contemplates from the start a wholly independent practice. Each patient, even if a member of a family you are working for, becomes for the time being his, to be treated according to his best ability. It is clearly for his interest to be careful and faithful, it is also clearly yours to put all the work you can into his hands and to use your influence to fill up his time with good patients. It leads you into considerate and kindly speech, makes you careful in your criticism not to weaken the patients' confidence in him or his ability. This last plan, in which I have had long experience, is the one which I approve, for it seems to me that it possesses just the right elements to make it fit perfectly into the relations between principal and associate as we have seen them.

It will be wise, I think, to give full details of such a plan as they have been gradually worked out. It requires first a period of instruction or probation of uncertain length, followed by a period of association for a fixed time. The agreement is that the principal provides free of expense an office, furniture, attendance, instruction, criticism, advice, and patients as far as possible, while in return for this the associate agrees to pay during the period of association a definite percentage of all his work.

During the period of instruction or probation the pupil is not allowed to charge for his services at all, but a small charge may be made, to such patients as can pay, for materials and small expenses, which is paid directly to the principal. The pupil receives nothing for his work during this period, which may vary from six months to two years according to his ability and faithfulness, depending for its duration wholly upon the judgment of the principal. It is clearly to the interest of the principal to make the period as short as he can so that he may receive some adequate return for his outlay both of money and time, but he cannot properly terminate it until he is prepared to say of the young man, "He does thoroughly good work," for his own reputation is at stake.

During the period of association the principal introduces patients to the associate, gives advice, supervises work, is consulted in all difficult cases, and, in short, stands under the younger man,

and allows him to build his professional life upon him. The associate makes a regular monthly return of his work, and pays a fixed percentage of what he receives after deducting expenses. After the fixed period of association, the same may be renewed at pleasure for a longer or a shorter time at the same or a lower percentage.

In presenting these details to you I am led by the fact that circumstances have made me study the practical working of such a scheme from both sides for over thirty years, and it is in view of this long experience that I speak with so much assurance. If what I have written shall be of use to any man burdened with a large and growing practice, who feels that he needs help, I shall be very thankful.

In conclusion, let me give you a bit of history. There is now living in retirement in Cambridge, Mass., an old man, blind for the past thirty years and so crippled by rheumatism as to be entirely helpless but for the devotion of a loving and faithful wife. During his years of active life he gathered round him a band of young men, and by example and precept so stimulated them to effort that the impulse of his personality still lingers among them. They have in turn endeavored to pass the torch to others, till there are now about twenty men in active practice (eight among the list of members of this Institute), besides five who have passed away. All are trying to uphold the sound principles of honest and faithful work which he taught. What a comfort to him is this thought, and what better monument can Dr. E. J. Dunning have than these lives, working out an impulse derived directly or indirectly from him? He may well say, "*Si monumentum queris circumspice.*"

IS PORCELAIN INLAY WORK IMPRACTICABLE?

BY DR. C. F. ALLAN.

MR. CHAIRMAN.—As I have read the dental literature of the past year and have conversed with my professional friends and acquaintances, it has seemed to me that there is almost a general consensus of opinion in our country, among dentists, that porcelain

¹ Read before The New York Institute of Stomatology, June 3, 1903.

inlay work is impracticable; that at the best it is only available in easily accessible cavities in the buccal and labial faces of the side and front teeth where gold appears in its greatest unsightliness. Few dentists in our country have earnestly advocated its use and very many have decried it; one who has been much in evidence in our journals the past year having even asserted, and seemingly without contradiction, that there has been no such humbuggery perpetrated on the dental profession as that of filling teeth with porcelain.

Now, I do not think there is any gentleman before me who agrees with the dentist I have just quoted, but I wish to tell you of what I saw in Dresden, and I am sure there is no one here to-night who could have seen the results I saw attained in Dr. Jenkins's office and still believe that porcelain inlay fillings are impracticable. Dr. Jenkins is every inch a professional man, and no one here is more in earnest than he is. He has thought over this work and experimented in this line for many years, and now he has his methods in such practical shape that every day I called at his office he had new patients for me to see, a new line of cavities for me to examine. He was most hospitable, and was not only willing but anxious that I should see every step in the process; not only the patient in the chair but also the laboratory work, and I feel that I am greatly indebted to him for his insistence. The patients I saw were not in any way show patients, but were those in every-day practice, with whom in most cases appointments had been made weeks before. I saw all kinds of cavities filled, among them several occlusobuccal cavities in molar teeth as well as proximal cavities in bicuspid, all done with the same seeming ease, with practically little discomfort to the patient, and with the result that the line of demarcation between filling and tooth could hardly be observed.

Dr. Jenkins, in the paper which he read last year before the American Dental Association, said that it was his idea to devise a system, not for the exceptional cases only, *but for the filling of cavities generally as met with in every-day practice, and that was what I saw.* He uses his own low-fusing body, which is the result of an immense amount of experimenting and which seems to me an ideal inlay material. When fused it is homogeneous and can be ground and polished the same as an Ash tooth. It has the strength of any of the high-fusing bodies, and he has made it in most of the

shades that will be required. It is very finely ground, and for that reason does not contract to as great an extent as some of the other bodies, and has also the important quality of fusing with exactly the right fluidity, so that any reasonable amount of contour can be attained in its use; this to me is one of its best qualities.

Possibly the feature of Dr. Jenkins's operating that impressed me most was the little attention paid by him to parallelism of walls. Every attention was paid to margins, that they should be sharp and well defined, clean and free from little irregularities, but only as nearly at right angles with the surface of the tooth as was consistent with the easy withdrawal of the matrix, and this latter point was always in view. Retention was then assured by the undercutting of the cavity and the cutting of retaining lines in the sides of the inlay. Every detail seems to have been provided for by him, and small Arkansas stones for the engine, beautifully made and of different shapes, were used for smoothing the margins,—of course this smoothness of wall and freedom from small irregularities made easy not only the withdrawal of the matrix but the future stripping of the gold from the inlay.

Dr. Jenkins has an assistant, and every one who is going to do much inlay work will want an assistant like his. I had the misfortune to break an upper central incisor while in Dresden and sought Dr. Jenkins's services, and he suggested that while I had the space I had better have an unsightly gold filling in the lateral removed and a porcelain inlay put in its place. I feel quite certain that this did not take over three-quarters of an hour. Dr. Jenkins thought best to have two inlays made of different shades in one which would match in color best, his *Fraülein* making one and he the other. While I was in the chair she came into the room and said she wished to see the tooth to determine how much contour was required, and for such work I could but think that *possibly* a woman's trained hand would be more delicate than a man's.

A case of restoration I would like to mention as showing the great possibilities esthetically of this work. The lateral incisor of a very comely middle-aged woman had been so mutilated that there was not much more than a peg of a tooth remaining, and this had migrated to the cuspid, so that there was a broad unsightly space between the dwarfed peg of a lateral and the central incisor. He baked and set an inlay on the mesial side of the lateral and then wedged the tooth and inserted an inlay on the distal face,

and the transformation in the look of that woman's mouth was simply wonderful; but I think, though, even the patient was not more delighted with the result than I was to have such a perfect standard before me to work up to.

Dr. Jenkins uses a gas furnace. I know that in this country much stress has been put on the advantages of the electric furnace over gas, but I think any one who sees Dr. Jenkins at work in his laboratory and notes the perfect work done so rapidly will feel that he is not working under any great disadvantage. With the high-fusing bodies, however, I imagine the electric furnace is practically a necessity.

In speaking at random in this way I feel that I am not doing Dr. Jenkins justice, but I hope I have convinced you all that inlay work is practical and should be practised, and that all honor is due the deviser of this method, *which instead of showing up decay and announcing defect simulates nature so beautifully.*

In closing a few points occur to me, answers to questions that have been put to me at different times.

The fusing-point of Dr. Jenkins's body I am not certain of, but it is two hundred or three hundred degrees below that of pure gold, a safe margin for the use of the latter as a matrix. He uses numbers 30 and 40 Williams rolled gold, and he takes the matrix direct from the cavity and, as a rule, without the use of the rubber dam.

I have been asked about the amount of space required for the insertion of inlays in proximal cavities, and I can only answer in a general way that the space sufficient for the putting in of a well-contoured gold filling seems sufficient to Dr. Jenkins for the inlay. In baking the inlays it is a general idea that great care should be taken in the cooling off; this is not so, and it is the only point of procedure in which any amount of recklessness can be indulged in. Preferably this work should have a separate room, or at least a corner and a table devoted to it alone, with every convenience, and the greatest attention must be paid to neatness and cleanliness.

The shadow bugbear is with us a very real one, why it is not so with Dr. Jenkins I cannot understand, unless it is the perfection of joint is so good and that the polish of the inlay runs into and is in a measure continuous with the tooth.

THE COLLEGE MAN IN DENTISTRY.

BY HARRY L. GRANT, D.M.D., PROVIDENCE, R. I.

ALL acknowledge that it is the duty of every man to become as fully developed mentally and physically as his capacity will allow. On this point the old and well-tried saying, "Heaven helps him who helps himself," is particularly applicable. No college educates the man; it simply makes it possible for him to educate himself. The development comes from within and not from without. That a man may become fully educated without the college training is equally true, as many examples show; but when one considers "the greatest good to the greatest number," the *summus bonum*, it is acknowledged, without exception, that, other things being equal, the man of average mental capacity is better fitted for life's work, whatever that may be, if first he have such training as is received in the average college course of to-day. To be sure, all who take such a course do not become so mentally trained, but the average man, of average ability, with an average ambition, never regrets the time and money required for the undertaking, and, what is more important, his work in life, whether it be in business or in a profession, will certainly show marks of the broad and deep foundation upon which his "specialty" has been erected.

The amount of knowledge an individual takes with him from college is very little. What, then, does he accomplish in the four years' course? He learns better how to use his brain, how to study, how to systematize his work, how to concentrate his powers, how to persevere. He has a broader, better view of life, he is freer from jealousies, he is less conceited, and has a more charitable view towards his colaborers.

Few, if any, ever have cause to regret a college training. Many who have attained great successes in life regret this lack. They feel that the foundation is weak. The superstructure has been built with the utmost care, but upon an insufficient foundation.

Who is better able to judge than those who have tried it? What better argument is there than the fact that the father who is college-bred, almost without exception, sees to it that the son has the same advantages, whatever calling the son may follow.

Once a college education was regarded superfluous unless a man was to enter a profession; that is, unless he was to become a

teacher, a clergyman, a lawyer, or a physician. At the present time the larger number enter business, every branch of business, including mechanical pursuits. Many take technical courses, and hold their own with men who have spent all their time in technical or manual training.

Is the man who enters the shop at a tender age a better machinist than he who has had a liberal education and allows his mechanical ability to develop as he develops his whole mental power and learns how to use his brain? Cannot the man of liberal training the better direct his power, the better acquire manual dexterity, than the other? It may take longer, but will not his attainment be equal to or greater than that of the other?

Many college men become physicians; few become dentists. That there are very many finely educated men in the dental profession one can readily see by reading the reports of the various society meetings. There are as many great scholars in the dental world as there are in any of the other scientific pursuits, but they are few as compared with those of the rank and file. Does more mental training take away the power to develop manual dexterity? The spark of mechanical ability is born with the child. Will he develop it the less if he has a liberal training?

It is claimed that "The advance of the preliminary entrance standard to the very highest degree possible at the present time—the diploma of a high school, unless that be a high school of manual training—*promises to lower the standard of dental attainment.*" The writer does not wish to affirm or deny this statement, but with his present limited knowledge it does seem as if the rank and file of the dental profession would show as much manual dexterity, would be more professional in their relations with one another, would show fewer cases of commercialism, fewer cases of moral depravity, if there were more college men among them. And in pursuance of the same thought, to the writer it seems desirable that some schools—not all—should not stop with the high-school diploma, but year by year raise the standard to a college degree.

If it is desirable that the physician, the lawyer, and the clergyman should have a college training, it certainly is just as desirable that the dentist should have the same. When a college man reads in a dental journal that more mental capacity means less "dental attainment," it sends a certain twinge through his nervous system, with a desire to hear more from college men in the dental

profession who have better opportunities for observation than he. He recalls several college class-mates, with marked manual dexterity, who have since attained greater distinction than their fellow-workers, because of the skill coupled with larger mental capacity. The difference between the laborer and the man who plans and carries out the work is one of mental capacity. Manual dexterity requires mental capacity. Every one cannot have the same amount of brain-power in the ends of his fingers, and to the writer's mind that power cannot be lessened in the least by requiring a high standard for entrance to the dental school. The partial elective system of college allows one to follow out the work for which one is best fitted, but does not allow him to become one-sided, as he might by following one line of work only.

Is there not something of the same difference to-day between the man of liberal education in dentistry and the one without, that existed years ago between the graduate of a dental school and the one who studied in an office only? Is not the one a step in advance of the other?

The dental profession cannot have too many liberal, fair-minded men. The man of college training or *its equivalent* has greater mental capacity, better judgment, better self-control, better power of concentration and application, more fraternal feeling, and is on a higher plane than the same individual would be without such training. Are not these qualities desirable in the dental profession at a time when we hear so much and see so much of so-called "quackery," "commercialism," egotism, and jealousy? Laws are powerless to overcome such evils. It can be done only by the education of the individual, and in what manner can that be attained except by requiring a high preliminary education for entrance into the dental profession?

FUNGOUS GROWTH OF THE PULP.

BY JULIO E. MARTINEZ, D.D.S.

ON December 12, 1898, Marion J., a mulatto woman, twenty years old, came under my care complaining of a very sore tooth,—the second right lower molar,—which presented a cavity of decay occupying the whole masticating surface and also portions of the

buccal and labial surfaces. The bulk of this cavity was completely covered by an hypertrophied pulp, which had a highly congested appearance and was rather spheroidal in form. According to the patient, the growth had started two years ago, when by the action of decay the pulp was exposed. At first no appreciable soreness was felt, but later on it became quite troublesome, especially whenever food was introduced in the cavity or pressure was exerted during mastication.

As the only means to get rid of the growth, I proceeded at once to remove it. After isolating the tooth by the rubber dam, I applied some crystals of trichloroacetic acid and allowed them to remain for five minutes. Then by means of a sharp spoon excavator, which had been sterilized, I removed the growth from its base. Then I wiped the cavity with phenol-sodique and applied a dressing of iodine to the remaining portions of the pulp, sealing the cavity with a temporary stopping of gutta-percha. Three days after I renewed the iodine dressing, and at the third sitting, a week after, I was able to remove the rest of the pulp almost painlessly. The canals were cleansed by means of sterilized broaches followed by injections of a three-per-cent. solution of hydrogen peroxide, and a temporary dressing of iodoform and oil of cloves was sealed in the canals. A week after, as the tooth seemed to be in a healthy condition and the dressing was clean, I filled the canals with oxychloride of zinc, after having washed them again with hydrogen peroxide, followed by absolute alcohol and warm air, in order to insure complete dryness; and three days later I placed a permanent filling of amalgam in the cavity.

I had the opportunity to see the patient four months after she was dismissed, and learned from her that she has not felt the least amount of pain or discomfort since the treatment was completed.

FUNGOID PULP.

BY WALTER W. BARTON, D.D.S.

ON January 10 John D., aged eleven years, presented himself in the clinic for the purpose of having his upper anterior teeth regulated. Upon examination it was found that all of his six-year molars were badly decayed. The upper left first molar had a

large cavity on the morsal surface which was almost completely filled with a red, spongy tissue, which had no connection to the lateral walls of the tooth, and was diagnosed as fungoid pulp. This was caused by exposure of the pulp by caries, and followed by continued irritation, which produced the low form of granulation tissue peculiar to this growth. This was somewhat sensitive, but not to the same degree as a healthy pulp.

The prognosis being favorable, the cavity was washed with a three-per-cent. solution of hydrogen dioxide and crystals of iodine packed around the bulbous mass, but could not be sealed in. The case was treated twice each week, and at the second sitting the pulp was greatly reduced in size. After applying the dam the cavity was again washed with hydrogen dioxide, and iodine crystals were sealed in with gutta-percha and gentle pressure used.

This treatment gave no pain, and at the next sitting all the bulbous portion of the pulp was absorbed. This was followed by two applications of carbolic acid and iodoform, when the pulp-canals were entirely cleansed and a dressing of iodoform and carbolic acid was placed in the canals for a few days. There being no putrescent odor at the end of a week, the canals, which were not closed at the apex, were filled with gutta-percha, the tooth was lined with oxyphosphate, and the remainder of the cavity filled with amalgam.

This treatment extended over a period of three weeks.

FUNGOID PULP.

BY R. L. GOODING, D.D.S.

On Thursday, January 19, Miss C., aged ten years, came to the clinic for treatment. On examining her mouth, I observed her teeth were very irregular and carious, and in the right lower first permanent molar there was a cavity of considerable size, the lingual and distal sides of which were broken down, and a short case of polypus or hypertrophied pulp presented itself. The case was diagnosed as being one of that character, and I proceeded with my treatment. To apply the rubber dam was impossible, so resort had to be made to the napkin. I isolated the tooth as well as I could

and applied trichloroacetic acid crystals, burning off a great portion; then, with my engine-bur and excavators, removed as much as possible. At this period of the operation I observed my patient was getting faint, so I concluded by placing in the cavity cotton saturated with iodine, and then a temporary stopping.

On her return two days later the previous dressing was removed and arsenic fibre was applied, and Robinson's remedy, hermetically sealing the cavity. Her next visit was on the 23d, when I found that the arsenical application had had no effect, and the part was exceedingly painful and congested, so I applied acetate of morphia and oil of cloves, and had her return on the 27th. This time I made an application of a double dose of arsenic, using the crystals along with morphine acetate and oil of cloves. The next day I removed this application, and found that the death of the pulp was complete. All putrescent matter was removed, the canals thoroughly cleaned in the usual manner, and a dressing of Black's 1, 2, 3 placed in.

I had her return at different intervals, when I renewed the dressing, and on February 21, finding the conditions perfectly healthy, I filled the canals with oxychloride of zinc and the cavity with amalgam.

[REMARKS.—There is a general feeling prevalent in the dental profession that it is a hopeless waste of time to treat fungoid or hypertrophied pulps. Until of recent years teeth thus affected were universally condemned to the forceps. Various methods have been devised to destroy this character of pulp, but only with limited success. Some years ago Dr. Maercklein, of Milwaukee, announced that they could be removed by the application of crystals of iodine. This was tried in the clinic of the Dental Department of the University of Pennsylvania, with some modifications, and found to be very satisfactory. The papers given were cases in that clinic. These were selected from a number as typical of the method at present used.—EDITOR.]

PROFESSIONAL DIGNITY.¹

BY J. MORGAN HOWE, NEW YORK.

MR. PRESIDENT AND GENTLEMEN.—We have reached a high degree of discipline in New York, and disobedience to orders is something that no one dares consider, consequently I am here to bore you in answer to this toast. It reminds me of the story of Donald the Scotchman, who, in answer to an inquiry in regard to a new neighbor, what like of a man he was, said, "He is a curious laddie. I went down to have a bit talk wi' him the other evenin'", and he offered me a glass of whiskey. He was pouring it out, and I told him to stop,—and he stoppit! That's the kind o' man he is." Obedience to orders sometimes makes those who issue them sorry, and I am sure that those who have issued these orders to me are sorry now, or will be. But I promise you, Mr. President and gentlemen of New England, I will consider your defenceless situation at this late hour.

It is long since the immortal dramatist put into the mouth of Aragon, in the "Merchant of Venice," "Let none presume to wear an undeserved dignity;" and probably ever since that time there has been some danger that dignity would be assumed undeservedly. As civilization advances and becomes more complex its outgrowths assume the conditions and principles that underlie them, and I hold that the principles pertaining to a profession are very similar to the fundamentals of civilization itself. We remember that Emerson said, in his "Essay on Civilization," that "steam, electricity, rapid fire guns, gum shoes, and such like evidences of intellect, were the toys thrown off in the exuberance and exultation of the security and freedom of a healthy morality in society." And he said also that morality was the one essential in civilization. Yes, gentlemen, who hear me do not need any suggestions in regard to morals, professional ethics, or anything of that kind, but there is not one of us who is not lowered in our status by the methods of advertising that are employed in the different cities of this country. The dark-skinned drummers in uniform inviting victims into den-

¹ Remarks made at the Union Meeting of The New York Institute of Stomatology and the American Academy of Dental Science, Boston, March 21, 1900. Its reception was delayed, and hence appears unorthogonally at this late date.—Ed.

tal parlors, vying with dental departments in department stores, are inconsistent with dignity, but almost all these institutions are conducted by graduates of dental schools. It seems to show that the dental colleges of the land do not succeed in inspiring their graduates with an ambition to be more than tradesmen. The desire for material gain entirely supersedes the wish to be worthy members of a profession. We look entirely to colleges, to journals, to societies, and to laws for the means of professional elevation. I hold that no matter how learned the members of our craft may be, no matter how skilful, if their desires and aspirations are on the level of a factory, and they are willing to accept a strictly business relation to their *confrères* and the public, they are not elevating the profession, but lowering its status and detracting from its dignity. It has been reported, as a private opinion of Kipling's, that Cecil Rhodes needed no morals,—he was building an empire. I would set over against that remark an expression made by President Eliot (whom we have had the honor of claiming as a guest to-night) in an after-dinner speech in New York not long ago, when he said that the past year had been the most prosperous that Harvard had ever enjoyed, and he added, in explanation, that he meant by prosperity that the intellectual and spiritual element of the University had grown in power and strength. I think that remark is in key with our claim, that the status of educational institutions, and of professions that depend upon them for the equipment of their members, cannot be expressed in terms of a mill or factory, but in those of intellectual and moral relations. Yet our dental journals are constantly referring to what they call "professional progress" in terms that are applicable only to materials and methods.

It seems to me that there is much to be desired in ethical progress, or its equivalent, professional progress. There is no doubt in this age that scientific progress will take care of itself. The tide of material advancement of our time will carry us along whether we will or no, but moral progress demands that we should resist the current, in which we seem to be beyond our depth; in which we have lost our footing. It seems to me that acquiescence in the influence exerted upon our moral sentiments through trade channels, and the control of our literature by corporations that are supplying us with goods, is inconsistent with true dignity. We are indebted to manufacturers for enterprise in furnishing supplies, but we ought to cut ourselves loose from them more than we have

in the matter of ethics. We need, in the first place, to decline to continue to use secret preparations. Almost all of us are using preparations of which we know nothing of the composition except in a general way, and many of the colleges, if not all of them, are teaching the students to use alloys that they know only by the name of the maker. Practitioners of dentistry constitute the majority of the stockholders in a supply company that urges the sale of its secret compounds in advertisements that claim that *our make* is the only one fit to use. The corporation owns and sells patent devices, while denouncing indefinitely the abuses of patents in the hands of others. And the president of the company is an officer of the National Association. Certainly these things do not suggest professional dignity.

The commercial control of our literature is demoralizing. We may say that it amounts to nothing; that the instances are very few or unknown in which there has been any interference with a free expression of opinion. Yet the ownership and control are for commercial purposes, and they are supreme. These patent conditions, in which we acquiesce, are going on from year to year. They might be rectified by a united effort; and decision on the part of just such societies as we are would be potent to accomplish a great deal in elevating the moral tone of societies, colleges, and practitioners. In proportion as this is accomplished will we deserve a dignified position in the community.

Abstracts and Translations.

ERRORS CAUSED BY THE FALSE INTERPRETATION OF THE RONTGEN RAYS, AND THEIR MEDICO- LEGAL ASPECTS.¹

BY CARL BECK, M.D., NEW YORK.

SINCE the Röntgen rays began their triumphant march from the modest town on the Main throughout the world, our knowledge of the obscurer ailments has been greatly enlarged, and our methods

¹ Read before the Society of Medical Jurisprudence of New York, May 4, 1900.

of treatment have been revolutionized. It may safely be said that treatises on fractures, for instance, which were written before the Röntgen era, have ceased to be regarded as authoritative. The proofs of the immense usefulness of the Röntgen rays in surgery are so overwhelming, indeed, that to discuss them would be carrying owls to Athens.

Unfortunately, the strangeness of the subject soon attracted many imaginative and speculative minds, that drew unwarranted conclusions and spread erroneous impressions. The ease with which some of the small bones of the human body can be reproduced by the rays on a photographic plate led many medical novices and even ignorant laymen to the indiscriminate use, or rather abuse, of the new discovery. Little wonder that the consequences of such abuse of the rays were soon heralded and misapplied by officious friends, inconsiderate and malicious *confrères*, and last, but not least, by shyster lawyers. It naturally shared the fate of other inventions, as did anæsthesia and asepsis, and as still do many new remedial measures.

The public mind was deplorably disturbed by reports of extensive dermatitis and gangrene of the skin. But while in some individuals a peculiar trophoneurotic idiosyncrasy may exist, predisposing to dermatitis, in the great majority of cases the burns of the skin were caused either by the ignorance of the unskilful operator, the tube often being too near the object, or by too prolonged and too often repeated exposures. Such accidents are not surprising so long as laymen, such as opticians and instrument-makers, who understand nothing of the anatomy and physiology of the skin, are intrusted with "the manufacture of skiagrams." As in many other respects, the question of "proper dosage" must also here be perfectly understood by the operator. A person who irradiates a patient suffering from sycosis, for instance, every day intensely for a whole hour, irrespective of the reaction following such a radical procedure, so that gangrene occurs, is as much qualified to do skiagraphic work as is a shoemaker to prescribe morphine.

Since February, 1896, I have made nearly three thousand skiagraphs, and have never observed the slightest irritation of the skin in any case in which the rays were used for diagnostic purposes. In but two cases did circumscribed depilation supervene. In both skiagraphy of the skull was required frequently and at

short intervals. In the first case depilation began after the fifth, and in the second case after the sixth, exposure. Within three weeks the depilated spots had recovered their hair. In addition to such misadventures, crass ignorance is responsible for many distorted Röntgen-ray pictures, which caused such fatal errors that even medical men felt much discouraged by such results. But in considering these errors more closely, it becomes evident that the Röntgen rays never lie, but that it is entirely our own imperfections which induce us to err under peculiar circumstances.

In order to avoid errors, it should in the first place never be forgotten that a so-called Röntgen-ray picture is by no means an ordinary photograph of an object, but a silhouette only (skia-graph),—that is, a photograph of its shadow. To interpret such shadows properly, a thorough knowledge of the normal anatomical relations of the tissues, especially of the bones, that produce such shadows is required. As the most minute gradation of density is registered, it is important to be thoroughly acquainted with the anatomical relations of the bones producing the doubtful shadow. The question, then, would be whether the supposed shadow is normal or not. On certain portions of the skeleton the muscles and tendons would naturally cause obscure shadows. The carpus is especially likely to produce such errors in the skiagraph; the tuberosities of the trapezium, the scaphoid, the hamulus ossis hamati, the os pisiforme, and the eminentia carpi radialis, radialis, and ulnaris double up the thickness of the carpus, thereby causing dark shadows, which might be mistaken for foreign bodies. Similar considerations and similar cautions apply to the other diagnostic opportunities offered by the rays.

If a skiagraph of the human hand, for instance, is taken, the plate will show the least light where the bones rest, while the soft tissues appear opaque. There is also a difference of opacity according to the thickness of the tissues, their blood-supply, and their air-capacity. The foot, while easily skiagraphed in the direction of the dorsum towards the planta pedis, from the toes up to the upper third of the metatarsus, presents an obstacle farther backward in the first and third cuneiform bones and the scaphoid, so that it is necessary also to skiagraph the foot on these portions transversely by having the outer face rest on the support. It is by this procedure only that the isolated shadows of the astragalus, the calcaneum, the os cuboidum, the scaphoid, and the fourth and fifth

metatarsal bones can be distinctly outlined, so that false interpretations may be excluded. In the early era of the Röntgen rays the normal sesamoids were also sometimes incorrectly interpreted.

How important the knowledge of minute anatomical details is, especially of non-pathological abnormalities, will be evident from the fact that the os intermedium cruris (os trigonum tarsi) has been mistaken for a fragment severed from the astragalus. This bone is a typical part of the tarsus of all mammalia, and its frequency is estimated at from seven to eight per cent. Shepherd, who mistook this bone for a fractured fragment, says, "The fact that this fracture is not mentioned in any of the text-books of surgery or in special treatises on fractures would easily be accounted for by its only being discovered by dissection; it causes no deformity, and the symptoms it would give rise to during life would probably be obscure." The same author tried to produce this fracture artificially on the cadaver, but "in every case," he says, "where this manœuvre was performed, I failed, even when the greatest force was used, to break off the little process of bone mentioned above." Pfitzner regards the os trigonum tarsi as an integral part of the posterior process of the astragalus in the adult, which is analogous to the os intermedium antibrachii.

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The significance of a skiagraph for the purpose of estimating the degree of functional disability is not always conclusive. A skiagraph may show a considerable degree of bony deformity after a fracture, and still the function may hardly be disturbed at all. Skiagraphic test has shown that, as a whole, even our best functional results show by no means an ideal union. An unscrupulous patient who secures possession of a skiagraph of his own case, which shows considerable deformity, may, although there is no functional disturbance, strongly appeal to a jury on the strength of his skiagraph, if he succeeds in simulating great impairment. On the other hand, there may be but little evidence of bone injury on the skiagraph, but there may be severe impairment of function on account of the injury to the soft tissues (circulatory, trophic, or inflammatory disturbances), which can be represented only faintly, if at all. This shows the necessity of considering all the other clinical symptoms in connection with the skiagraph.

While it is easy, even for a layman, to understand the significance of most skiagraphs, there are, as alluded to, injuries the

correct interpretation of which presupposes, besides thorough anatomical knowledge, the greatest care and a vast amount of experience as to the different modes of delineation in various projection planes. The greatest diagnostic difficulties are offered by the joints. The more complicated a joint is, the more complicated the skiagraphs of its various positions will naturally appear. It is especially the elbow-joint and hip-joint which are kept in view. First of all, the interpretation of the displacement caused by supracondylar fracture of the humerus, and the deformities resulting from it later on, may tax the power of discrimination considerably. The older the fracture, the less conspicuous the fracture line will appear, since it will be more or less overshadowed by the callus. In old fractures the lines cannot be represented as such, and it is only in case of union in a displaced position that its features can be guessed. In the case of a lady aged seventy years, for instance, a second skiagraph, taken three years after a supramalleolar fracture was sustained, showed essentially the same features as the first, which had been taken four weeks after the injury.

In case of the entire absence of displacement, it is only a very distinct skiagraph that shows the line clearly. It is natural that in such cases there is no skiagraphic evidence after recovery,—that is, in from four to ten weeks, according to the type of the fracture. Should a court, for instance, doubt, in such an event, that there had been a fracture, a skiagraph taken after such a period might show a negative result, although there surely was a fracture. In this boy whom I present to you to-night, the very distinct skiagraph, taken only two months after he had sustained a subtrochanteric fracture of the thigh, showed no signs of a fracture. Had this case not been skiagraphed shortly after the injury, no evidence of the fracture could have been subsequently obtained. When no displacement existed, only a faint fracture line will show, but the presence even of a small amount of callus leaves no doubt as to the previous existence of a fracture.

On the other hand, callus formation may be so abundant that, in spite of the absence of displacement, the fullest evidence of fracture may still be furnished after months. In one of my cases, callus formation was so excessive that the attending physician was accused of malpractice, and it was the skiagraph only which convinced the patient that his physician had treated him correctly, the bones being in perfect apposition.

The intra-articular fracture types offer the greatest diagnostic difficulties, inasmuch as the fracture line is also often obscured by the callus formation. If, however, a skiagraph of the other joint is made at the same time, in the same position, and in the same projection, the various delineations of the shadows will be correctly understood and interpreted.

A normal skeleton should also always be compared with the skiagraph. It should particularly be remembered that certain pathological conditions, such as rachitis, for instance, influence the outlines of the bones and may deceptively be supposed to represent a portion of an injury. In such an event the skiagraph of the fellow-extremity will set matters right. In very young children the eminentia capitata appears as if entirely severed from the humerus, although the relations are absolutely normal. The explanation of this very important phenomenon is that the epiphyseal tissues are not sufficiently ossified to produce a shadow on the plate. If these points are not thoroughly considered, a displaced fracture fragment might be erroneously diagnosticated. Union between the epiphysis and the diaphysis of the head of the humerus is not perfect before the twentieth year. The lower epiphysis of the humerus consists of four nuclei, which ossify from the eighth to the seventeenth year. The epiphyses of the trochlea as well as of the olecranon ossify between the seventh and twelfth years, which explains why an osseous nucleus that is still connected with its neighboring epiphyseal nuclei and the diaphysis by cartilaginous tissue appears as an isolated piece of bone which might erroneously be taken for a fragment. The acromio-clavicular junction sometimes shows in the skiagraph a hiatus of the width of a finger, so that a diastasis of the joint might be assumed. But since our knowledge on this new subject has increased, we know that this apparent diastasis is by no means pathological, and that there is a normal gap between the osseous ends of the acromion and the acromial end of the clavicle. The upper epiphysis and the diaphysis of the radius unite between the seventeenth and the eighteenth year, and its lower epiphysis and the diaphysis join in the twentieth year. During the early Röntgen era the translucent space above the epiphyseal cartilage in children was erroneously taken for a fracture line. The head of the femur unites with the diaphysis at the eighteenth or nineteenth year, and the lower epiphysis follows after the twentieth year. The upper epiphysis of the tibia unites

with the diaphysis in the twentieth or twenty-second year, while the lower tibial epiphysis unites with the diaphysis between the eighteenth and the nineteenth year.

For the thorough interpretation of skiagraphs in children, it is important to know that at birth the diaphyses of the radius, the ulna, the metacarpal bones, and the phalanges are ossified, while their epiphyses, as well as the whole carpus, are still cartilaginous. It is not before the seventh year that an osseous nucleus shows at the lower epiphysis of the ulna. Union with the diaphysis sometimes begins with the twelfth year, but, as a rule, not before the fifteenth. Even then a small epiphyseal disk remains, which does not disappear before the seventeenth year in the female, and not before the nineteenth year in the male.

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In fractures of childhood it should also be remembered that the process of ossification is influenced by various affections of the bone, as, for instance, by rickets.

How important the question of projection is becomes evident when we consider that grave errors may sometimes occur even if all the preliminary conditions required for a thorough understanding of the case seem to be fulfilled. This will appear from the following experience, which has probably not been paralleled in the literature of this subject (compare *New York Medical Journal*, January 6, 1900).

A boy four years of age, while playing in the street, fell against an iron bar. Being unable to rise again, he was taken up and carried to St. Mark's Hospital, where in the first instance moderate pain was noted besides the functional disturbance. There was neither any difference in level or any other deformity, nor any shortening or the typical equinus position. A photograph taken two days after the injury only showed a very moderate and uniform swelling of the leg. Abnormal mobility and crepitus, in accordance, could be produced only by very rough manipulations.

On the day following the injury two skiagraphs were made in different positions, one of them in the dorsal and the other in the lateral position. To my surprise, the one which had been skiagraphed by a direct irradiation, the centre of the platineous disk of the tube being perpendicular to the anterior surface of the leg, did not show the slightest indication of a fracture, while the one which represented the leg irradiated from the outer aspect of the

tibia showed a marked fracture line. The fracture presented the typical oblique type in the middle of the tibia, the fracture line running from below anteriorly to above posteriorly, the upper, tapering fragment overlapping the lower end. No sideward displacement having been present, it can be understood why the rays reaching the long axis of the tibia in a vertical direction did not show the fracture line. A very slight change in position, when the inclination towards the fibular direction amounted to less than one millimetre, brought out the fracture distinctly.

Now, if I had, as is the custom in general, taken a skiagraph in the antero-posterior direction only, and if the manipulations made during the first examination were carried out as gently as they properly should be, the fracture might have been overlooked entirely. And if, in view of the local pain and tenderness, the swelling, and the functional disturbance, the possibility of a fracture had been seriously considered, the skiagraph might have silenced the uneasy conscience.

If the case had been brought before a jury, the expert might there on the strength of the first skiagraph have testified in good faith that there was no fracture.

This experience teaches the necessity of adopting the principle of always taking at least two skiagraphs in two different positions in all cases of suspected fracture.

In taking skiagraphs of foreign bodies it must be considered that their size varies according to the distance from the tube. In oblong bodies great errors as to their extent may be committed. Once I was very much surprised in a case in which a needle-fragment had entered the palm of the hand in a perpendicular direction. The plate, while indicating the presence of the needle, distinctly created the impression that the fragment was only about two millimetres in length. When extracted it was found to be more than an inch long, the rays having reached the hand in a perpendicular direction so that the circumference of the fragment was reproduced rather than its length. A side view, of course, would have cleared up the error at once.

Misinterpretations have also arisen from unavoidable mechanical and chemical defects, causing markings in the photographic plate, the significance of which must be well known to the skiagraphic interpreter. Blemishes may also be produced by spots caused by pus from wounds or by perspiration.

In the location of foreign bodies, especially in the skull, many errors were and are still committed. Their avoidance will be considered in a special article.

The case of the German malingerer is a striking illustration of the significance of the Röntgen rays, which for a time proved a protection on account of erroneous interpretation, but showed the case in its true light when assisted by better anatomical knowledge. Soon after the discovery of the Röntgen rays the courts were in a position to grant damages to patients, especially veteran soldiers, who claimed to have been damaged by bullets and were unjustly rejected by medical experts as malingerers. The presence of the bullet, shown on the photographic plate, cannot be denied, and a patient who harbors a piece of cold metal in any part of his body has, as a rule, a good reason to complain. On the other hand, an impostor, who pretends to have been shot and stimulates functional disability, will be exposed by a distinct skiagraph, which would show the absence of the alleged bullet.

It is a question to be solved by my colleagues of the other faculty, whether the court has a right to censure a surgeon for not having used the Röntgen rays in a suitable case, and furthermore whether it can compel a patient in a doubtful bullet—or fracture—case to submit to an exposure to the rays.

A distinct skiagraphic plate will always tell the truth. If accompanied by the registration of the details of operation,—viz., the source of the current (whether battery, static machine, or street), the length of spark of the induction coil, the intensity of the tube, the distance of the platinum disk of the tube from the photographic plate, the position of the object, the kind of plates, and the time of exposure,—it will be a valid document, intelligible to every expert. And together with the anatomical and clinical knowledge of the expert it should be evidence in court.—*Medical Record*.

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A MEETING of the Institute was held at the office of Dr. James B. Locherty, 136 West Forty-eighth Street, Tuesday evening, June 5, 1900, the President, Dr. E. A. Bogue, in the chair.

The minutes of the previous meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. C. F. Allan presented a communication entitled "Is Porcelain Inlay Work Impracticable?"

(For Dr. Allan's paper, see page 717.)

DISCUSSION.

Dr. J. H. Downes.—Mr. Chairman, while I came here as a guest and only to listen, I have been greatly pleased with Dr. Allan's description of inlaying as it is done by Dr. Jenkins, and I would like to ask him if he can tell about the temperature at which the porcelain body fuses.

Dr. Allan.—I am not certain as to the fusing points.

Dr. Downes.—Does he take an impression of the cavity?

Dr. Allan.—No; he takes the matrix directly from the cavity. Dr. Jenkins prepares his cavities without undercut. With these little stones he cuts in the side of the inlay grooves for holding the cement. He depends a great deal upon the perfect fit of the inlay for support.

Dr. F. Milton Smith.—I would like to ask Dr. Allan whether in proximal cavities more separation would be required than in inserting a gold filling.

Dr. Allan.—I think it would depend a great deal upon the operator; some men require more separation than others. I generally require four thicknesses of India tape.

Dr. Smith.—I think it would require much more separation than I find necessary for an ordinary gold filling in an approximal cavity. I do not raise this as an objection, for if we need the space we can get it. I recently set an inlay made of gold in this

manner. I feel that if I had had a little more space the result might have been better, although I am very well pleased with it. I think this inlay work has a great future and do not see so many weak points about it as have been suggested. It has been suggested that the cement is the weak point, but there are similar points to gold fillings, as some of us have found out to our sorrow. Regarding the weakness of inlays because of the cement, we have only to recall the cases of those men who for several years have been replacing the worn-down tips of teeth with soldered gold tips. These men will tell you that they consider this among the most permanent work they do. As regards large fillings in the back of the mouth, I can imagine the relief to the patient in having the work done out of the mouth. A few months ago I contoured with gold soldered inlays three teeth for a lady patient. The work done in the ordinary way with gold filling would have taken hours and the results would not have been nearly so satisfactory. Had I used porcelain I should have done much better for my patient. It would appear that the principal difficulty with this class of work is that comparatively few in the profession will be willing to master the minute details connected with its successful prosecution.

My judgment is that every man who will master the mechanical part of it so that his inlays will fit perfectly will be much pleased with the work.

The President.—There is one question regarding these low-fusing inlays which has not, as yet, been satisfactorily answered. I refer to the question of their durability.

Dr. C. F. Allan.—So far as I know they have undergone the same tests that the high-fusing inlays have been put to, and I can see no reason why they should not last.

The President.—I wrote to Dr. Jenkins once asking him how long he had been using these particular inlays and what their durability was, but I got no reply to this part of my letter. I think that Dr. Jenkins's inlays, as such, have been in use three or four years.

Dr. Geo. S. Allan.—Relative to high-fusing inlays, I called on Dr. Head, of Philadelphia, some time ago. Dr. Head is the advocate of the high-fusing inlay. I met with the most courteous reception. He showed me all the steps of his method of operating. He had a patient, a gentleman with the mesial surfaces of the first and second bicuspids gone. There was destruction of at least

one-third of the teeth. It was evidently an extreme case. I saw the whole process from the making of the matrix to the baking of the porcelain. The whole operation was short of two hours, possibly not more than an hour and a half. The patient was subjected to no discomfort. These inlays after they were set were perfect imitations of nature. Although I did not examine them very carefully, to all appearance the edges, color, and contour were perfect. It is certain that in these cases, where there is only a very thin line of cement exposed, there would be nothing like the wasting away which occurs in a cavity filled with cement alone. I have been placing in inlays for some time, but I feel that I have taken hold of it wrong end foremost. I am perfectly satisfied that the process has real merits, and the man who does it successfully will please himself and his patients and do work that will not only last, but artistic work. Where I have failed was in thinking that I could take a matrix from an impression and have some one else do the baking. I believe, to succeed, one must do all the work himself. The process does away with half the labor in preparing the cavity, the edges being the main thing; the general shape of the cavity is not a matter of much importance. The insertion of the inlay is almost play for the patient. The inlay fitting the cavity satisfactorily, the operator has only to see that the cavity is kept dry and the inlay is pressed uniformly and steadily to position. A few undercuts is sufficient to hold it in position. I trust that this method will be pushed to its fullest extent in this country, and that the time will soon come when there will be many Dr. Heads doing this work. I think Dr. Jenkins deserves our commendation for having brought this process before the public.

Regarding the old method of grinding up a piece of tooth to fit the cavity, I have cases like this in my practice which have been in the mouth six or eight years, and even longer, and they show perfect to-day. In my own mouth I have three or four that Dr. Raymond put in for me three or four years ago, and they are a great source of comfort to me and as perfect to-day as when they were first inserted.

Dr. I. F. Wardwell.—I would like to emphasize what Dr. Allan has said regarding the absence of discomfort or pain where this method of inlays is employed. In inserting a gold filling it is generally not the preparation of the marginal walls that causes the discomfort, but the preparation of the undercuts necessary to

retain the filling. I have recently employed inlays in a number of cervical cavities which were very sensitive, and had I used gold would have been more painful. I am very thankful that Dr. Jenkins has given us this idea, because I have been in the habit, in days gone by, of grinding up the inlays to fit the cavity. A lady was in the office the other day for whom I ground in one of these inlays six or eight years ago. It was in perfect condition, and she said she had had a great deal of comfort from having so conspicuous a place fixed in that manner.

Dr. Geo. S. Allan.—It was only last week that in a buccal cavity in a lower molar I placed an inlay with a minimum amount of pain to the patient. After thoroughly preparing the edges of the cavity I was not particular in removing all the softened dentine and giving it a retaining shape, but after rendering it aseptic I set the inlay with very little discomfort to the patient. I used nitrate of silver in the cavity during the excavating.

The President.—Can Dr. Allan suggest anything regarding the shadow which is said to come from the line of cement?

Dr. C. F. Allan.—I fancy that in these inlays where the line of cement is reduced to the minimum, the shadow effect would not be very noticeable.

The President.—Dr. Head and Dr. Hoffmann have both had somewhat to say regarding shadows in inlays placed in lateral cavities. Dr. Head read a paper before the Odontological Society a few weeks ago in which he showed that inlays which absolutely matched the tooth in which they were to be inserted when viewed laterally were very much darker than the tooth. It is a condition that it would be well to watch for and look into.

Dr. C. F. Allan.—I might suggest that this darkening may be due to a different reflection of light. Two years ago I ground in an inlay in a cervical cavity in a central incisor for my daughter. Looked at directly in front the shade was perfect, but viewed from another direction it was not so good. I attributed it to the fact that I had polished the surface of the enamel of the inlay, causing a difference in the reflection of the light.

Charles O. Kimball, M.D., then read a paper entitled "The Dentist and his Associates."

(For Dr. Kimball's paper, see page 739.)

DISCUSSION.

Dr. C. A. Brackett.—Although a member for years, I believe this is the first occasion of an ordinary meeting of this organization which I have been able to attend.

Some years ago in connection with a literary organization I had relations with some public speakers. I remember the case of one honorable gentleman who was to speak upon the subject of "Shakespeare." He said with reference to the suggestion of his speaking concerning another prominent character that he would not dare to speak concerning him, because he had only been studying his life for a short time, two years, and that he did not feel competent to say anything concerning the biography of that man. He had been studying Shakespeare for thirty-five years. Our friend who has read this paper is in a similar position. Drawing from the richness of a long experience he knows whereof he speaks. In listening to him I have been immensely gratified.

I have had experience in these relations both as assistant and as principal, and in every such association the arrangements have been advantageous for the principal, for the assistant, and for the people served. I cannot conceive how the subject could have been more ably or profitably treated than it has been by the essayist. The relationship as described seems ideal. I am much gratified with what he said concerning the qualities which are desirable in an associate; that in addition to a high order of professional ability he should have a firm grounding in excellent moral principles; that he should be a chaste man, a man whose amusements are of a wholesome and ennobling kind, and, above all, that he should be a man having a genuine respect for noble womanhood. All of these things impressed me, as I know they impressed all here present, very forcibly.

One other thought. It has been my privilege for many years to see many young men in our dental schools and recently graduated, and I have wished over and over again that they had a better appreciation of the opportunities that are before them in the world, and of the great mountain of work that is waiting to be done by those who make themselves competent personally, professionally, and morally. I have always found it difficult to sympathize with a man who cannot find work to do. I most earnestly wish that the students in our colleges could have a better appreciation

of how the older men are watching them, looking for able assistance as their own work increases and their powers fail. I wish all young men might be more profoundly impressed with the importance of the diligent use of time, with the value and the limitations of life, and with a full sense of the opportunities for achievement which lie before them.

Dr. C. F. Allan.—The paper is so excellent, the thoughts so well expressed, that I shall not attempt to discuss it, but shall wait until I can read it and ponder over and try and remember and profit by some of the beautiful thoughts.

Dr. A. L. Swift.—I have nothing to say in discussion. But wish to express my appreciation and thanks to the essayist for his most excellent paper.

Dr. E. S. Robinson.—I have listened with more than ordinary interest to this paper, as it has been my privilege to have been associated with Dr. Kimball both as a student and as an associate for eight years. I am happy to say that the training I received under him will be of the greatest value and service to me throughout my professional life.

Dr. Geo. S. Allan.—I regret to say that I never had any training in my younger days under a man whom I can look back upon with respect, and so had to work out my own salvation as best I could, but I can appreciate how fortunate a young man is who is able to get into an office and receive the training which Dr. Kimball mentions. I am very glad that I had the privilege of listening to this paper.

Dr. J. B. Locherty.—My sentiments are certainly fully in accord with those of Dr. Kimball. I had the pleasure of being associated in the most cordial manner, during the earlier part of my professional life, with a man who is a guest of the Institute to-night, Dr. Downes, and the benefit to be derived by the associate from an excellent preceptor is of inestimable value in fitting the young practitioner for a future professional career.

Dr. W. M. Whitlock.—I hardly feel competent to discuss this paper. The field properly belongs to men much older and longer in practice than myself. I think, however, that something may properly be said from the stand-point of an associate, and from the associate's point of view I venture a word of approval and appreciation of the essay.

It does not seem to me that there is a word or a thought in the

paper that a properly constituted young man could take exception to. The relation between the principal and associate mentioned by the essayist is ideal. While there is and ought to be financial benefit accruing to the principal under this arrangement, the benefits received by the associate in the way of instruction and introduction are so great that it is he who receives the greatest gain. I feel that if, when I left college, I had started in practice as an assistant without further training, I would have fallen into a rut that I could never have gotten out of, and the services given my patients would not have compared with those given after the careful training spoken of by Dr. Kimball. The value of being able to consult at any time one who has had experience cannot be overestimated. It is certain that the incentive to the associate who is building up a practice and having the benefits of the experience of men who have had years of practice is much greater and more ennobling than it can be to the assistant who is waiting for Saturday night to draw his salary.

Dr. Kimball used a very beautiful symbol, "the passing of the torch." To pass a torch it is necessary to have a torch to pass; in other words, to train an associate it is necessary to have something definite to give him. The principal should have, rooted to his very life, an ideal which years of experience have convinced him is the best, and he should insist upon the associate becoming master of it. His life and work should be of such a high standard that it will be an inspiration and a goal towards which the younger man will work. I can say with all earnestness, as an associate, that this has been my experience. I shall ever be grateful that at the beginning of my professional life I have had the benefit, through association, of experience and knowledge accumulated through generations.

Dr. S. E. Davenport.—It is usually the theorist who has the most clearly defined ideas and the best way of expressing them, but we have listened to-night to an essay upon a chosen subject by a gentleman who is a practical man in the field and one with long experience in the training of associates. We have also heard the expressions of confidence and approval from several of the brilliant results of this training. We certainly are all under obligation to Dr. Kimball for his paper, which shows such careful preparation. There is, I know, a great difference of opinion as to which is the best plan of relationship between principal and

associate, but I think we have been shown by Dr. Kimball, as the result of his long experience, the way in which both parties to the contract will be best served. There are, of course, difficulties in the way of making an essay complete on this subject in all its practical bearings, because it is necessary to go over such a large field, and especially in this instance the Executive Committee requested the essayist to condense his remarks into a shorter period of time than he really should have had. It is for this reason, no doubt, that we are left in the dark regarding so many points concerning which it would be interesting to have Dr. Kimball give us further information.

Dr. J. Morgan Howe.—I cannot let the opportunity pass without congratulating Dr. Kimball upon his paper; I wish to thank him very much. It has been suggested that the great advantages of the association he has discussed are that the associate is able to give to his patients much better services than he would without such pupilage, and also that he is able to establish a practice among a desirable class of patients in a much shorter time than he otherwise could, thus starting his professional life earlier. In that regard it is comparable, I think, to the experiences of young men in the other professions, where it is becoming more and more necessary for them to become associated with practitioners of established reputation in order to have a reasonable chance of success. It occurs to me that this may be one of the signs of our professional development.

Dr. F. Milton Smith.—I think it has never been my privilege to listen to a paper on any subject in any dental society that has more forcibly or pleasantly impressed me. I presume the paper impressed me more because I am one of those unfortunate men who, after graduating from the dental college, never had the advantages of association with such a man as Dr. Kimball. I can say without hesitation that I would have gladly given five years after graduating from college, without a penny of compensation, if those five years could have been spent under the careful training of such a man, for then I should have had a foundation which I think something might have been built upon. As it is, I have had to learn by hard knocks what little I have been able to learn in dentistry.

The President.—The gentlemen here, I think, will all agree with me that we owe our thanks to Dr. Kimball for his carefully

prepared paper and on a subject that apparently had little to recommend it. I hope he will favor us with a full answer to those who have discussed his paper.

Dr. Kimball.—There is very little to say excepting this, that it is impossible in going over so much ground in a paper to give full details. I shall be very glad at any time to answer any questions regarding the methods and minute workings out of such a plan. As I stated in my paper, I have observed the working of this plan, not only in my own office but in the office of Dr. Dunning and his successors, and also in the office of quite a number of my friends. Without exception, where these principles have been carried out, where the associate has been carefully selected, and where the principal himself has had something to give, the results have been most satisfactory. Of course the principal must have something to give. You cannot get something from nothing, and unless he has a real professional character and is willing and anxious to impart his professional experience to his associate, the plan cannot succeed. In these young men we see growing up the men who are going to make the strong, helpful, and efficient men in the years that are to come, and I feel fully persuaded that in this way alone can we hope to make our profession what it should be. Any idea of the profession gaining in character by outside influence, that is to say, by dinners or by shows of any kind, is altogether false. If we are to be a profession looked up to and respected by other professions we must be ourselves men whose character is based on broad and deep foundations built up by liberal instruction. We must be such men as we see in the ranks of our leading clergymen, lawyers, and physicians. You know what they are. They are almost all of them college-bred men. They have had broad advantages. We must see to it that our young men also have these advantages; this is the only way in which the profession can ultimately stand on a par with the other professions. I believe if we all of us were as thoroughly rooted and grounded in general training as we are in our professional specialty, we should exert a broader influence than we do. I say this very plainly because I am among my friends whom I love and respect, but there are many men in the profession to-day who would be stronger and more helpful men if they had had better advantages when they started. Think how much fuller some of our lives would have been if, in addition to all we have been able to acquire, we had had a broader

and a deeper foundation upon which to build, and let us use every influence and power we possess to see that those coming after us are so prepared.

Upon motion a vote of thanks was extended to Dr. Kimball for his excellent paper.

Adjourned.

FRED. L. BOQUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR monthly meeting of the Academy of Stomatology was held at the rooms of the Academy, 1731 Chestnut Street, Philadelphia, on the evening of Tuesday, April 24, 1900, Dr. J. T. Lippincott, President *pro tem*.

A paper entitled "Extraction of Living Pulp from Teeth under the Influence of Cocaine Anesthesia produced with the Aid of Mechanical Pressure," was read by Dr. Wilson Zerfing.

(For Dr. Zerfing's paper, see page 581.)

DISCUSSION.

Dr. Huey.—I do not have many opportunities to try this experiment, as I do not have many pulps to destroy. Probably three or four times during the past year I have tried the cocaine method, and very successfully. I have not been able to make the operation absolutely painless, as Dr. Zerfing has, but have always inflicted more or less pain, and only resorted to the method in order to accomplish the work at a given time. Dr. Zerfing's reports of success will induce me to experiment further in this line.

I should like to ask Dr. Zerfing if there were any apparent reasons for the failures in the three cases that he cited; also whether his observations were made in private practice.

Dr. Zerfing.—In one of them there was none. The patient would submit to almost anything, but the pulp simply would not submit; in other cases the patients would object to almost anything; in still other cases there was no apparent cause that could be discovered. In some cases, where failure might have been ex-

pected, we found it very successful, even with sensitive patients. I do not think the opportunity would come in private practice to get that number of cases in a reasonable length of time.

Dr. Gaskill.—I notice that a number of these cases that Dr. Zerfing has cited were in comparatively young persons. I wonder if he found it more successful in these patients of sixteen, seventeen, or twenty years of age, and what has been his experience with older persons.

Recently I was very anxious to remove the pulp from a lower first molar, in a man about thirty-eight years old. I had a rubber dam on, put cocaine in, tried to force it in, and worked an hour and a half. Then I put in a little arsenic and brought it out at once.

Dr. Jack.—I would state that I have not pursued this method. I have, indeed, not tried it. My usual method is to instil cocaine, or to use cataphoresis. Where I use instillation a rubber dam is placed and a saturated solution of cocaine hydrochlorate applied. I fill the cavity with the saturated solution. In the course of a few minutes I am able to insert the broach and commence the instillation of the cocaine to the deeper parts of the tissues. I proceed by that method to the root of the tooth, until I am able, in a short time, to reach the apex of the tooth and remove the pulp. I might cite one case that I had two or three years ago. A patient came to me from a distance with a pulp fully exposed. I recognized that by treating her in the ordinary way with arsenic I would keep her in town for several days. In less than half an hour, by the method mentioned, I not only removed the pulps from both roots, but filled the roots with oxychloride of zinc, and the same day I filled the external cavity and sent the patient away. Repeatedly since I have done the same thing. In a number of instances, however, I have felt it necessary first to devitalize a portion of the pulp with arsenic, making but one application, and desensitizing the remainder of the pulp by instilling cocaine as related. Generally, however, I prefer cataphoresis, occupying perhaps fifteen minutes in the process of desensitizing the entire pulp.

I had a case a short time ago, where it was necessary to crown two centrals, two laterals, and one bicuspid. In this case the pulps were not exposed, but the teeth had been abraded very nearly to the gum. In one case the resistance to the current was so great that only one-fortieth of a milliampère of current was passing.

The surface of the dentine was so extremely dense, on account of the abrasion, that after trying to introduce the cocaine I had to drill some little distance below the surface and recommence the application of cocaine by cataphoresis. In the course of eighteen minutes the pulp was desensitized to the apex of the root and removed. It was similar in each of the other cases, the time consumed being about fifteen minutes. In no case was there any irritation whatever from the current. In one or more cases it was found that the pulp was not anesthetized to the apex of the root. The remaining portion was then anesthetized by instillation, by filling the pulp-chamber with cocaine and conveying it by the ordinary Swiss broach to the apex of the root.

I believe that in the three cases which Dr. Zerfling found to resist the application of the cocaine by pressure I should at once have applied the cocaine by means of cataphoresis, and I think that I should certainly in a few minutes have been entirely successful in producing anesthesia.

Dr. James Truman.—I have nothing very practical to say on this subject. I have had something to do with the observation of some of the cases in the clinic of the University of Pennsylvania, and have tried the experiment there myself several times with varied success. Those cases in which it seemed to me it failed were those in which arsenic would probably fail, and were cases in which the pulps were excessively irritated. In his report Dr. Zerfling mentioned such cases as, for example, pulp-nodules, where there is almost always a degree of inflammation. I do not know whether in his experiments he has tried chloroform instead of alcohol. I would suggest the experiment to him. Chloroform, it seems to me, would give a better result than alcohol, though I have not tried it. Sometimes with alcohol I could work in through the pulp-chamber and get beyond it, but beyond that was sensation which required repeated effort.

I have myself no doubt about the operation; it is a very simple one, that can be and ought properly to be applied in place of arsenic in many cases. I do not think it can always be used, but probably as often as arsenic can be.

Dr. Head.—I have been very much interested in the extraction of the pulps without the aid of arsenic for some years, but unfortunately in my hands arsenic has not seemed to give the satisfactory results that many of my brother practitioners have been able to get.

although I have frequently been told by others that they were able to kill the pulp by arsenic without any pain whatsoever. The most troublesome pulps were those in which congestion had been caused by pulp-nodules, and when I first began to practise I found arsenic unable to cope successfully with this condition. I later on tried cataphoresis, but the method which I had used, and which I now use very frequently, seems, in the greater number of instances, to have given the best results. I drill into the tooth as far as I can without giving the patient too much pain, and then fit the nozzle of my hypodermic syringe into this opening by means of a packing of rubber dam, so that when I inject cocaine solution into this opening the full pressure can be obtained. While the patient is under the influence of nitrous oxide gas I drill through into the pulp-chamber and inject about one to two minims of a ten to fifteen per cent. cocaine solution. When the patient recovers consciousness the pulp is usually entirely insensible. I make another injection, in order to be doubly sure of absolute anæsthesia; then I open the tooth and remove the pulp in the ordinary way. I have done this with molars, because the rapid extirpation and removal of the filaments of pulps in the roots seemed impossible under gas, but with the centrals and laterals and cuspids, and even the first and second bicuspid, I have found the rapid extirpation of the pulp under gas to have given excellent results. It has only been within the last month or two that I have used the method spoken of this evening by Dr. Zerfing, and while I have not been able to secure absolute freedom from pain, still I must say it is an extremely useful method, and one which, when it has been perfected, will give as good results as any one method that we have ever had. With all methods there will certainly be a number of failures. The rhinologists and other specialists of the medical profession who use cocaine find certain patients for whom cocaine is inactive, and I have patients for whom I have injected cocaine into the pulp with pressure, and it has remained absolutely unaffected by it, although the patient had some slight systemic effects from the cocaine, showing conclusively that the cocaine had entered the tissue.

Dr. Kay.—I have been trying this method for some time, and when I used alcohol I did not always have very good results, but sometimes I did have. It was suggested to me to use chloroform, and since then I have been using chloroform and cocaine, and in every case I have been able to take the pulp out absolutely without

pain and in most cases within two minutes from the starting of the operation, which I think is quite a success.

Dr. Gaylord.—About two years ago I experimented with this method, as sold in the West as a secret. It was only a short time after that an opportunity presented itself for trying it, and while I did get the pulp out, it was not a painless operation by any means, and it required, I think, three applications.

The next case was perhaps more successful, but not entirely so, and then I thought I would try another scheme. With a fine sand-paper disk I sharpened the point of a hypodermic needle as finely as I could. I took off part of the bevel, so that the point of the needle would not have to be inserted deeply under the pulp before the orifice would be entirely embedded, and so that the solution could go directly into the pulp. Once in a while I find a case where the hypodermic cannot be inserted without any previous application. In such case I make the application of cocaine and alcohol, and that will, as in every case I thus far have had, obtain the pulp sufficiently to insert the point of the needle. I find it a very easy matter to inject the cocaine into the pulp. I think it will be the experience of all those who try it that cocaine will penetrate the pulp with very much less force than it will penetrate the gum tissue, and the solution I use is the one for which I believe we are indebted to Dr. Huey,—cocaine hydrochlorate, ten grains; carbolic acid, ten grains; atropia, one-fifth grain; ten minims of one per cent. nitroglycerin solution; water, two fluidounces. This solution I find is almost perfection in the way of a local anesthetic. I inject it into the gums and wherever I have had occasion to use cocaine, and never yet have I had any ill-action from the cocaine, either sloughing of the gums, paroxysms, or heart trouble. In cases where teeth are cut off for crowns, if one hesitates to drive in the orange-wood stick, the use of the needle can very easily be brought into play. Insert the point of the needle immediately after the tooth has been excised and inject, and there will be no trouble in extirpation. In every case where I have used the needle the pulp has been removed painlessly, and I consider it very much better than the use of arsenic, even if the first puncture of the needle should cause pain. In using arsenic you are always liable to have a severe toothache in a couple of hours. So far as my experience goes, if you once get the point of the needle in, you can always get the pulp out without much pain.

Dr. Huey.—That formula ought to have quotations around it. It is a published formula which I repeated.

Dr. Jeffries.—I fortunately do not treat many pulps, and I have not had a very extended experience with the use of cocaine, except that had some months or a year ago, with the aid of cataphoresis, which I have largely abandoned, because of want of success with it, which is perhaps due to my inability to use it properly. I have extracted, however, without pain in a few cases with the aid of the cataphoretic current and cocaine, but my experience is not very extended in that line. I still rely more upon arsenic than upon cocaine.

Dr. Jameson.—I have had very little experience in the use of cocaine, except with the aid of cataphoresis, which generally proves satisfactory, if we take the time for it. I almost always use arsenic, and I very seldom have a patient complain of any pain. I make my application, see my patient the next day, remove the application, and make a second. I have learned by experience not to apply arsenic, however, to a pulp that is inflamed. If a patient comes to me with a pulp exposed and inflamed, I first soothe the pulp, even if it take two or three days, and after that I apply my arsenic. If properly sealed, my experience is that there is little or no pain. When I have occasion to destroy a pulp that has not been exposed, I expose it with a drill and make my application, and it is very seldom that the patients say that they have had any pain with the application. That does not agree with the experience of Dr. Zerfing and a great many others, but that is my experience. I always see the patient the following day, and if necessary make a second application.

Dr. Register.—The paper we have listened to this evening is one that will probably cause a great many to investigate the subject much more thoroughly than heretofore. We should remember that we get a complete circulation of the blood through the pulp. In the application of arsenic, the reason we get pain is because we produce pressure, which may produce stasis of the circulation in the blood-vessels while the nerve circuit is still open. The only way to reduce pain in a condition of this kind is to resort to force of some character, or to wait until the neurotic energy is lost. I have had some little experience with the use of cocaine, both by cataphoresis and by forcing it into dentine and into pulps of teeth. I have used it in four solutions, all of which I can depend on,—

one with alcohol, one with chloroform, one with alcohol and chloroform mixed, and one with fifty-per cent. solution of sulphuric acid. Cocaine mixes with all of these solutions very beautifully. With fifty per cent. of sulphuric acid it makes a very oily-looking mixture and is one of the best means I know of for the reduction of hypersensitive dentine. The sulphuric acid and its effects should be removed before filling. Of the solutions for pulp removal, I prefer the alcohol. I have in all cases succeeded in removing the pulp at the same sitting, but always have produced some pain. In the application of arsenic, the circulation in the tooth is suspended; and you can get no further influence of any medicinal agent by simple contact other than through a soaking-in influence, which is very slow. In these cases I have used with success a seventy-five per cent. solution of nitrate of silver. I hold it against the exposed portions for perhaps a fraction of a minute, and as it is a very strong coagulant of albumin, it will enter the pulp for quite a distance. You can now insert the point of a hypodermic syringe loaded with cocaine solution and complete the operation under local anæsthesia.

Dr. T. V. Smith.—I have on record twenty cases in which I have devitalized the pulp by means of cocaine and pressure, and I have found that the age has something to do with it; at least, such is my experience. In patients from twelve to fifteen years of age, the pressure seems to cause more pain, and in one case out of the twenty I could not obtain anæsthesia on account of the great pain from pressure. In that case I used arsenic, and on opening into that pulp I found the pulp-canal was quite large at the foramen; it bled considerably. In the other younger patients four were between fourteen and seventeen; in all of these there was more sensation than in the other cases, but beyond that age I found there was very little or no sensation whatever upon pressure or upon removal of the pulp.

There must be a good exposure, and all blood must be cleared away. There must be no hemorrhage while the operation is in progress. In one case I had of a molar, there was a slight exposure at the anterior cornu, and by three minutes and a half of pressure with cocaine in acetic ether, applied upon a little piece of spunk, I succeeded in anæsthetizing that pulp completely and in removing it.

I have taken a little cocaine hydrochlorate and mixed it with a

little water in order to make a thick paste. I placed a small particle of this paste over the exposure, saturated a piece of spunk with acetic ether, and applied this over the cocaine paste. Then, with soft vulcanizable rubber placed over the entire floor of the cavity, I made pressure with an instrument a little smaller than the opening of the cavity. For the anterior single-rooted tooth a pressure of about two minutes was sufficient; for a molar tooth, three and a half or four minutes. The hemorrhage seemed to be very slight, with the exception of one case, where the blood spurted from the canal quite freely. That was stopped with a little twenty-five per cent. pyrozone on cotton. The after-results in all cases have been very satisfactory. Where I have been compelled to, I have filled the root and crown at the same sitting, with good results.

Dr. William Trueman.—The question before us to-night is whether it is better to extirpate a live pulp wholly or partially anesthetized, or one that has been devitalized and has severed its connection with the surrounding tissues. Is the danger of the devitalizing agent passing beyond the apex of the root greater than that caused by leaving some portions of the tissue in the pulp-cavity, owing to the impossibility of thoroughly removing from it a pulp that still retains its normal connection with normal tissue? It is generally conceded that the pulp is not a mere occupant of the pulp-chamber, but that it is intimately connected with the tubules and apical tissues, and that upon devitalization these connections are severed, and it is possible thoroughly to remove the pulp. Now, can we do it when the pulp is in a normal condition? The possibility of doing it practically painlessly has been from time to time demonstrated. I have done it frequently, and I have known others who have. Many years ago a professional acquaintance said to me that he never used arsenic. He turned a little bur at the end of a Williamson broach, and when he reached the apex with it he cut off the pulp and removed it without, as he said, any more pain than ordinarily given by arsenic. As time went on quite a number of his patients came to me, and I was interested in getting their side of the story, which thoroughly coincided with what he told me. But the real question, everything considered, is whether it has any decided advantages over the devitalizing of the organ before it is removed. Many years ago I attempted to treat a pulp, and was not successful in obtunding sensibility. The patient called on Dr. Thomas to have the tooth removed. He recognized that it was a

valuable tooth, and suggested pulp-extirpation under gas, which was accomplished. He sent the patient back to me. So far as could be seen, the pulp was thoroughly extirpated and the canal filled with a little cotton and creosote; but still the patient continued to suffer pain, and I was unable to relieve it. He passed into the hands of a friend of mine, and finally that tooth was extracted. We supposed that a little portion of the herach had passed into the apex, and we expected to find it there, but such was not the case. The tooth was tolerated for a year, and was a constant source of annoyance, with no apparent reason for the extreme sensitiveness. The same thing has happened under cataphoresis, as related at the last meeting of the New Jersey State Dental Society. It is a many-sided question, and one which requires a good bit of experimentation before we can decide upon any one method for all cases, though meanwhile each may have its place. I think the essayist should be commended for his experiments and thanked for having brought this subject before us this evening.

Dr. Schamberg.—The discussion has brought a thought into my mind as to whether anesthesia is entirely due to the cocaine, or whether it is due to pressure. In the first place, the application of cocaine may allow for a certain amount of pressure, but if you press upon a vascular part, enclosed in a bony cavity, you will impede the circulation, and I doubt if any cocaine is absorbed after pressure has once been applied. I do not think that sufficient cocaine can be taken up by the pulp to thoroughly anesthetize it by simple contact. After pressure is once applied I believe the anesthesia to be due to temporary paralysis of the nerves, which permits the extraction of the pulp. If that be true, it is probably a better method than the injection of cocaine directly into the pulp, because, as suggested, a certain amount of cocaine can be carried beyond the apex of the root by injection. The same is true of the application of arsenic. Arsenic is absorbed very readily by the tissues, and if carried beyond the apex of the root, the destruction of apical tissue will naturally take place. I think, therefore, that any method which allows for the extraction of the pulp, and in as normal a condition as possible, without the use of any substances which will be taken up by the apical tissue, is the method that should be adopted. The method that Dr. Head has carried out under nitrous oxide is a very admirable one.

Dr. Nickell.—It has been my duty to have charge of an institu-

tion close to the city, where I have a large number of people to look after. I have used this pressure method for the last year, while going over the district, and I am very much pleased with it. I go there once a week, and could not possibly use arsenic unless I could see the patient within a short time. Sometimes the pulp will come out without the blood being compressed out of it, and after removal, in some cases, there is excessive hemorrhage. This is stopped by pyrozone or sulphuric acid, and the canal filled with oxychloride or gutta-percha.

The President.—Dr. Zerfing, will you close the discussion?

Dr. Zerfing.—I do not know that I have anything in particular to add. All of the failures were in young patients. I do not know that advanced age would be any factor against the success of the treatment. I have not found it so. I have not tried chloroform in place of alcohol, but from the experiences here given it seems to be successful.

As to the precise time required for the anterior or posterior teeth, I would say that I have found the time would vary from half a minute to five, six, eight, or ten minutes in either anterior or posterior teeth. Some anterior teeth require from five to ten minutes sometimes, but it is not the average. I think the average time is two to three minutes.

If in devitalizing pulps they would be affected by the arsenic just to the apex, all would be well, but if it goes beyond, we all know what may result.

I wish to express my thanks for the kind manner in which the paper was received.

OTTO E. INGLIS,
Editor Academy of Stomatology.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirtieth annual session of the New Jersey State Dental Society convened at Asbury Park, July 18, 1900. The meeting was called to order by the President, Dr. Wm. E. Truex, of Freehold, shortly after eleven o'clock. His address was a model in its way,—short, well worded, and appropriate to the occasion. He invoked the thankfulness of the society that death had not invaded

their ranks during the past year. He announced, as a pleasurable event, the organization of a local society in the southern part of the State. He then, in a few words, referred to the purposes of the Society, and suggested how they could be best attained at the present session. He reminded the members that they owed a duty to themselves, to the State, and to the profession at large. It was the privilege of each to do something for the general good of all as well as to profit by that which others might do. It was their duty to the State, and should be their pride, to keep their State Society well to the fore in the progress the profession was making; and their duty to the profession to see to it that the session added something worth the adding to dental science. As a matter demanding attention, he stated that he had recently been made aware of the fact that the members of the dental profession in New Jersey were not exempted from jury duty. This, he thought, should receive their earnest attention. They were entitled to and should receive as much consideration in this respect as did the medical profession, and he urged that prompt measures should be taken to bring it about. The address was confined closely to local matters, and his suggestions, few and terse, will probably go farther than they would if obscured by a verbose oratorical display.

The afternoon was given up to sight-seeing, the society convening for the evening session at eight o'clock. Dr. H. B. Thurston, of Louisville, Ky., read an interesting paper upon non-cohesive gold. He had, he stated, no new ideas to present upon so tried a subject. His only object in presenting the paper was to keep before the profession an excellent filling-material which seemed to have been, by a large number of dental practitioners, relegated to unmerited oblivion. Its preservative properties, properly used in selected cavities, could not be gainsaid; nor yet could they be scientifically explained. Dr. Miller, it is true, had found that for a limited time non-cohesive gold seemed to have a restraining influence upon germ growth, but so very slight and so soon exhausted was this virtue, it could hardly enter into the question. He attributed its disuse largely to the fact that the modes of instruction almost universally employed in dental colleges made it inexpedient to teach the use of non-cohesive gold in college clinics. While its employment presented no more difficulties than that of cohesive gold, the technique of these forms of gold-fill differed widely. The filling of a cavity with cohesive gold demands the

most careful and accurate attention to every minute detail from beginning to end; each particular piece must be placed and immovably held where it is intended to remain, and its condensation effected at once; while the adaptation to the walls of cavities requires a precision of manipulation and an intensity of application on the part of the operator which but few, he believed, were capable of. For these reasons the teaching of the use of cohesive gold afforded splendid manual training for the student, and a cultivation of that precision of technique which is so essential to the successful practice of dentistry. One who has become proficient and skilful in the use of cohesive gold-foil will very readily acquire the methods employed in working non-cohesive, but it is not so easy for one trained to the use of the latter to successfully manipulate the former. He suggested that the use of non-cohesive gold should be taught, and its use in such cavities as especially call for it encouraged in the college clinics during the later part of the term. He then proceeded to describe his methods of using it in various cavities. While nothing especially new was brought out by the paper or its discussion, nevertheless it was well calculated to do what the essayist desired,—to keep before the profession the time-saving, the labor, and tooth-saving qualities of non-cohesive gold-foil.

Dr. F. L. Fosheim, of New York, followed with a paper upon "The Combination of Oxyphosphate Cement with Gold and Amalgam Fillings." In this paper I noted nothing especially new. He advocated the use of cement as a lining to the cavity, usually placing the metallic filling while the cement is still soft, in some cases utilizing its adhesiveness to assist in retaining the filling. The possibility of pulp injury from the presence of the cement was touched upon. Judiciously used, he did not consider this an important factor, and suggested that in many cases of pulp injury reported, supposed to be due to the cement, other and more plausible causes were frequently present.

Thursday Morning, July 19.—Eugene Underhill, M.D., of Philadelphia, read a paper entitled "The Eyes and Teeth: Some Concomitant Pathological Changes." The title carried one back a century or two when books with that title were rather common, especially among the Germans. The later clause of the title to the paper gave it a more modern sound. It is, however, by no means a new subject, but was handled by Dr. Underhill on some-

what new lines. His main purpose was to show how the dentist and the oculist, by closely observing symptoms constantly before them, could be helpful to each other and more helpful to their patients. He described many disorders of the teeth that manifest themselves by symptoms which bring the patient to the oculist, and others of the eye that are first manifested by symptoms referred by the patient to dental territory. He explained at some length the why and the wherefore of this, and the importance of both the dentist and the oculist recognizing the true import of these several conditions. He especially impressed its importance in establishing that degree of confidence between patient and oculist or dentist essential to a successful practice, suggesting that, were an oculist consulted, and he, after an examination, pronounced the cause a dental trouble, or a dentist consulted, and, at once recognizing the true condition of affairs, referred the patient to an oculist; in either case, the diagnosis proving correct, the confidence, the reputation thus acquired in a single instance might lay the foundation for a large and lucrative practice. He described at some length symptoms of supposed eye trouble of dental origin; of supposed dental trouble originating within the oculist's domain; and others again closely simulating one or the other, sometimes both, which should be referred to the physician. He laid especial stress upon the more pronounced differentiating signs suggesting the real origin of the trouble; and urged that by close observation, with these as a guide, the more subtle, but yet more convincing evidences each must learn for himself be studied and thoroughly mastered. An important part of his paper was that devoted to the early diagnosis of malignant growths and the diagnostic signs of syphilis seen about the eyes. He urged that the importance of this alone was sufficient incentive for a dentist to be, so far as knowing and being keenly alive to the meaning of these signs which are so prominently and constantly before him are concerned, somewhat of an oculist; and on the same ground, he urged, it was equally important that an oculist should be somewhat of a dentist; and both sufficiently conversant with general medicine to distinguish a trouble expressed at its seat from one reflected, and to know whether it required for its relief a dentist, an oculist, or a general practitioner.

It was an excellent paper, one well worthy a careful study when it shall be published in full. Its delivery was marred by the speaker so frequently stopping to inject explanatory remarks, yea, or

humorous suggestions. Within bounds, this is, of course, allowable; it is, indeed, when tactfully done, useful to emphasize or clinch an idea. When, however, these breaks occur frequently, as it did in this case, and at times inappropriate, it is undignified; it breaks the thread of the discourse and distracts the attention of the audience.

This was followed by what may be termed a lecture, by Thomas C. Stellwagon, Jr., D.D.S., of Philadelphia, upon "The Blood." It was extempore; it would have been far more impressive had it first been committed to writing and read. The hesitancy, now and again going back to take up a forgotten thought, or to add an overlooked explanation, not only wastes time, but tends to the listeners losing the connection of ideas. He illustrated his remarks by several diagrams, and had in addition a number of microscopic slides conveniently arranged under microscopes. To a large audience, especially when the opportunity is given at the close of a session protracted beyond their usual dining hour, the attempt to show specimens under a microscope requiring delicate adjustment by each observer will always prove a failure. Now that the microscopic field can be so accurately photographed, and by the same art duplicated, or shown upon a screen visible to all at the same time, the instrument itself may well be relegated to the laboratory. It has ceased to be the novelty it once was, and its revelations no longer require for their delineation an artist's pencil, with its coarseness and its unavoidable personal equation.

The doctor has made a special study of the blood, and his remarks were, no doubt, a surprise to many. We learned that red and white corpuscles were not the only bodies floating in this important fluid, nor were they the simple things they were supposed to be in our school-boy days. We learned from him also that modern science had in this, as in other lines of investigation, by its increasingly accurate and far-reaching methods of research, dispelled many illusions of the past. He stated, at some length, the more recent theories regarding the origin of the various bodies found in the blood; their significance, and the diagnostic value of the changes in relative number, size, and form of those usually there found, and the pathological significance of unusual bodies, or those only occasionally met with. He dwelt especially on the importance of these matters in the early recognition of impending or established pathological conditions; at times these may be

noted early enough, he stated, to abort or control lesions that become very serious before being otherwise manifest. He spoke also of the rôle the blood played in some forms of germ-caused disorders; and of its relation in various ways to germ pathology and germ therapeutics. To one not thoroughly conversant with the subject it is exceedingly difficult to make a satisfactory digest or *résumé* of a lecture like this. It is well worth looking up, when it shall be published, for its value as an *exposé* of up-to-date ideas upon an important subject.

This was followed by an interesting event. Some months ago, as the readers of this journal will no doubt remember, several members of the New Jersey State Dental Society, who were also members of the Dental Protective Association, compounded with the International Tooth Crown Company for infringements, or alleged infringements, of their patents. This led to a much-to-be-regretted acrimonious ventilation of opinions in the dental journals, during which the motives of the gentlemen who compounded, and Dr. Crouse's management of and fidelity to the Protective Association, were called in question. Those who personally knew the gentlemen, and also knew Dr. Crouse, felt very sure that, notwithstanding both sides seemingly had grounds for complaint, it was a matter that would speedily change its complexion when properly understood. Dr. Crouse was present at the meeting the evening before, and asked that opportunity be afforded to clear the matter up. The time appointed was the close of this morning's session. When the time arrived Dr. Crouse took the floor. He gave a detailed account of those actions of his which had been called in question, and in an explanatory mood took up one by one the aspersions which had been cast upon his motives and his management of the Protective Association, especially those which had been assigned as excuses for defection from the ranks of the Protective Association. He asked to be questioned upon any points he had not made clear, and promptly answered all questions put to him. Having given his side of the story, he asked that the others, who were present, would give theirs, that they might, while they were together, face to face, clear the matter up. The applause, so prompt and so generous, was sufficient evidence that the audience accepted and were satisfied with the story he told. He was followed by those who had been accused of being unfaithful to the Protective Association. I see no good reason for repeating the stories told; there

are circumstances under which men feel impelled in their own defence to lay bare to their fellows in some measure their private affairs; when they have so done and made good their cause, is it not sufficient to publish this result alone? There was, in each case, special or personal reasons which, at the time they made their settlement with the Tooth Crown Company, left them but little choice, and made that course the wisest for them to follow. Their explanation was quite as satisfactory as was that of Dr. Crouse. The incident may be considered closed; it was—as the editor of the INTERNATIONAL DENTAL JOURNAL suggested at the time, when commenting upon it, it would probably prove—a misunderstanding and nothing more. A little calm correspondence, and a little less haste in rushing into print, would have saved all the unpleasantness and the humiliation of placing on record, for future generations to read, another unethical chapter in our periodical literature that can *never be blotted out*.

The afternoon was set apart for clinics. Dr. W. A. Capon, of Philadelphia, illustrated a method of anchoring porcelain sections (inlays) with platinum wire, insuring thereby a more secure hold in the cement. He was surrounded all the afternoon by a crowd of attentive observers.

Dr. George Evans, of New York, demonstrated, with specimens, a method of facing metallic shell crowns with porcelain,—a method he has published, and which is perhaps well known. I was not impressed with its value. The porcelain facing is necessarily frail, and upon bicuspid teeth has no protection from the stress of occlusion. In such cases the inlay method has decided advantages. A very small surface of porcelain is all that is needed, and that can be so placed as to be perfectly protected. The edges of the porcelain in the specimens Dr. Evans exhibited were very thin, and did not present a smooth and even outline.

The other clinics were of minor importance.

The exhibitors made a very creditable display. This has been of late years made a notable feature of the New Jersey State Society meetings, and an instructive one. The large room of the Auditorium is an ideal place for the purpose. It is sufficiently large to accommodate all, and as they are spread out, side by side, ample opportunity is afforded to see all they have to show, and to compare similar manufactures, one with another. This has tended, I am impressed, to restrain to a great extent the trade features.

The attendants are there more as exhibitors than as salesmen; they seem more anxious to show their goods than to solicit customers. It is impossible, with the space at command, to even name the firms represented, much less to describe their exhibits. The Water Fountain spattoon, with a porcelain bowl, for neatness and cleanliness, deserves especial mention. An electric throat and mouth light, made by the Unique Electric Device Company, of New York, costing, complete, with battery, five dollars and fifty cents, is the most compact arrangement I have yet seen. The light was very bright, with less than the usual heat. William Denker, of Dedchester, Mass., exhibited an outfit for quickly forming cavities in porcelain teeth, costing one dollar and fifty cents. It consisted of suitable tools fitting to the dental engine hand-piece, and an abrasive paste. It seemed a practical idea.

The Hammond electric furnace and rheostat, for crown-, bridge-, and inlay work, and an electric dental engine by the Ritter Dental Manufacturing Company, designed for an alternating current, having all the advantages of those made for direct current, are novelties worthy of mention.

At the evening session Dr. J. Allen Damon, of Newark, N. J., read a paper entitled "Dental Jurisprudence in its Relation to State Examining Boards; the Profession; the Laity."

This was a well-written paper upon an important phase of the subject, the doctor's attention having been directed, by reading a series of articles in a medical periodical, to a line of argument contesting the right of State Legislatures to curtail the rights and privileges of practitioners of medicine and dentistry by making the exercise of that right dependent upon the permission of so-called examining boards. He formulated a series of questions covering the contested ground, and submitted them to counsel, asking not simply their opinion, but also the grounds or authorities upon which their opinions were based, and for such other information as they might be able to give pertaining to the subject. This information was paid for, and was as carefully prepared as it would have been to meet a case at court involving the points at issue. It having been contended that the exercise of the power lodged in examining boards conflicted with the Constitution of the United States, especial attention was therefore first given to this point. His paper was largely made up of quotations from opinions thus obtained, of authorities cited, and of such extracts from

current periodicals as he thought would make clear the points he wished to present. He simply made himself the mouth-piece of those consulted, learned in legal matters and having no bias one way or the other to swerve their judgment. This gives to the paper an importance and a claim on professional attention to which very few of the many dissertations on this and allied subjects have been entitled.

The questions were, first, Has the State the power to prescribe the qualifications and conditions upon which a person shall be admitted or licensed to practise the profession of dentistry?

Second, Has the State the power to regulate and control the practice of this profession after a person has once been admitted or licensed to so practise?

He assumed that dentistry was one of the skilled and learned professions, standing on the same basis as law or medicine; and that, whatever power the State has over the matters referred to is derived from what is called the "police power." This, in its broadest acceptation, means the general power of a government to guard and preserve the public welfare, if need be, at the expense of private rights. It is one of the inherent powers of government, and, like the power of eminent domain, exists independent of, and is rather limited than created by the Constitution. It is necessarily despotic in its character, and individual and property rights, beyond the express constitutional limits, must yield to its exercise. The doctor, at some length, noted the various ways in which this power was exercised without question, all of which were as arbitrary and as much an invasion of private and property rights as is its application to dental or medical practice. Among these were the regulation of the speed of railroad trains and of trolley cars, preventing the adulteration of food, restricting the sale of dangerous drugs or intoxicating liquors. This police power, he said, can only be exercised by legislative enactment, and it rests solely within legislative discretion to determine when the public welfare or safety requires its exercise. It is an established principle in this country, that so long as the Legislature does not pass the limits fixed by the Constitution the courts have no authority to interfere, on the ground that the legislative acts in question violate a natural principle of justice and right. He then quoted a number of decisions sustaining these positions, and also disposing of the argument that the Constitution of the United States conferred

certain rights and privileges which the denial and medical laws unduly restricted. He contended that the evidence collected and presented placed beyond question the right of State Legislatures to determine who should and who should not practise either profession, the right to determine and to fix the qualification necessary, to establish such means, and to appoint such agents as they may deem requisite to ascertain whether or not the applicant possesses the knowledge and skill a safe and efficient exercise of the desired privilege calls for. The right to change from time to time these requirements was equally unquestionable; as was also the right of each State to maintain its own standard, and to insist on ascertaining for itself, in its own way, without regard to what any other has done or might do, the qualification of each and every applicant. The acceptance by one State as satisfactory of the standard and examinations of another is merely a courtesy extended; it cannot be claimed as a right. The constitutional provision that the citizens of each State shall be entitled to all the privileges and immunities of citizens in the several States does not mean that a citizen of the State of Indiana who comes to the State of New Jersey brings with him into this State the privileges and immunities which he enjoyed as a citizen of the former State, but rather, that upon his arrival here in this State he at once becomes possessed of all the privileges and immunities which pertain to citizenship of this State. In support of this view the doctor referred to the ease and readiness with which a divorce could be obtained, for instance, in South Dakota. A citizen of that place coming to reside in New Jersey could not demand from the New Jersey courts a like quick and easy divorce; he would be compelled to abide by the requirements of New Jersey law as fully as though he had always resided within the State.

He next referred to the preliminary education clause of the New Jersey Dental Law. It calls for a preliminary education equal to that furnished by the common schools of this State. This has been held to mean a full High School course, an education equal to that ordinarily provided by the High Schools of the State. This, he is inclined to think, is an error. The Constitution of the State requires the Legislature to provide for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all children between the ages of five and eighteen years. It is manifestly impossible to provide for every child in

the State a High School education; to attempt to do so would at once break down the entire system. The wealthier districts and the larger cities have these schools as part of their peculiar advantages, not as constitutional requirements, but rather through the exercise by the Legislature of a power therein existing beyond the constitutional obligation. He therefore thought, and quoted judicial decisions in support of this, that the educational requirement of the dental law was one equal to that of the common schools, and that graduation from a High School is not a necessary qualification to entitle a person to an examination for a license to practise dentistry in New Jersey. This brief *résumé* merely gives the gist of his paper; it must be read in its entirety to fully understand its purport and to appreciate its careful preparation.

Dr. G. Carlton Brown, of Elizabeth, N. J., who led in the discussion, questioned very much Dr. Osmun's suggestion that a common school education, as that term is used in the dental law, did not refer to a High School. He stated that it was the understanding of those who framed the law that it called for a qualification equal to that of a graduate of a four-year High School course, and was so understood by the Superintendent of Public Instruction. Referring to the New Jersey State Board of Examination resigning from the National Board, he said he did not see how they could do otherwise and still maintain their present high standard. It was understood that all State boards having membership in the national body accepted without question the colleges they recommended, many of which were contented with a preliminary education far below that required by the New Jersey board. To continue membership and refuse to recognize the standard adopted by the national board was not consistent with his ideas of honor; to lower the standard of New Jersey would be a step backward, would be to lose much that they had been so long striving for, and inadvisable. The discussion was an earnest one, mainly centring upon local matters. To many the resignation from the National Board of Dental Examiners, notwithstanding Dr. Brown's statement, was thought to be a disadvantage to the State, and later, a resolution was adopted asking the State board to withdraw their resignation, it being understood that it had not been as yet accepted by the national body, and to continue to work with them, hoping that by so doing they might be instrumental in inducing other State boards to, as soon as practicable, bring

their standards to a uniform requirement of a full High School course.

Friday Morning.—Dr. Meskor read an interesting sketch of his twenty-five years' stewardship as secretary of the Society. He has been an earnest and faithful officer, and much of the success of the Society and its more notable features are due to his tireless efforts in its behalf.

The following officers were elected for the coming year: President, Dr. F. Edsall Riley, of Newark; Vice-President, Dr. Wm. L. Fish, of Newark; Secretary, Dr. Chas. A. Mesker, of Newark; Treasurer, Dr. Henry A. Hill, of New Brunswick.

WILLIAM H. TRUMAN.

Editorial.

THE NEW AND THE OLD.

THE question of novelty in professional methods is a constant cause of friction. The young practitioner of a decade or two and the young graduate are practically upon the same level of thought, their minds apparently revolve in a circle of small diameter in which the present seems to be above and beyond anything heretofore attained, or that may be attainable in the future. This is not a pleasant or a profitable condition. It seems to be forgotten that progress is ever working spirally, always returning in part to a former position, and that, after all, the real advance made is not by any means so great as the surface indications would warrant us in believing. The dental periodical literature teems with the new-old things, and this is not always confined to methods and appliances, but occasionally some one will grow irritated because the elder practitioners are unwilling to accept everything proposed as original with this generation. In illustration of this the following quotation from a discussion reported in a Western journal sufficiently illustrates. The speaker is made to say, "Every once in a while I hear some old fossil get up and say that in 1843, or '39, or '27, or something like that, all of these things were talked of and used for this, that, and the other purpose. But when you read the books that contain the description of the methods and

treatment you will find that that was not true." While the expression "old fossil" seems to lack a reverential awe of the ancients in the dental profession, the subjects of this criticism have no reason to complain of this American way of treating old age, for it is felt to be peculiar to the rough and ready methods of thought and expression belonging to very recent civilizations. The old fossils are, however, not so far wrong as the critic would have us believe. Dental progress has been marked by successive steps, and it is not surprising that succeeding travellers tread irreverently in the footsteps of generations of workers in the same direction. The class who are constantly discovering processes in vogue fifty or more years ago are numerous. If, then, some one of the ancients rises to state this fact, he is met with the charge, "There is nothing in dental literature to substantiate your statement." Both parties to this conflict of opinion may have expressed a truth. Thirty, forty, fifty years ago dental journals were few. Those that existed did so under the greatest difficulties. Dentists would not write directly for the then existing periodicals, and the latter were poor in quantity of matter and poorer in quality. Dentists had not then recovered from the effect of generations of prejudice. They were in the intermediate period when the closed door in dentistry was slowly giving way to the open one. The man in practice was yielding unwillingly the secrets of his laboratory and operating-room. The multiplication of colleges and societies changed all this, but it has taken many years to accomplish it; indeed, it may be questioned whether we are as free to impart to-day as we would like to have each other believe.

Those who attended dental colleges fifty years ago received more than those not thus favored, and many things were taught there that were not generally known, and are frequently introduced now as absolutely new; and probably they are to the man of another generation.

Very recently we have been favored with lengthy dissertations on the filling of teeth. These are all interesting and valuable to the practitioner, but the new in them is principally based on the dictum of Dr. Black, published in 1891, that in the preparation of cavities "extension for prevention" must be the rule. This article led to the adoption of methods of operative procedures that have had their chief centre in a Western city. The writer has no criticism to make on this method of practice, preferring to let time

demonstrate its value. Within limitations it is true, and it was considered so true fifty years ago that the operators of that period held it to be their duty to cut away on all proximate surfaces until they could reach solid structure. Extension for prevention is, therefore, by no means a modern thought. Indeed, some who had the pleasure of listening to Professor Elisha Townsend will recall the fact that he delineated the preparation of the "compound cavity," as he termed it,—the approximate and occlusal surfaces,—in almost similar terms to the "step" described by recent writers. It was not, however, illustrated in the books and dental periodicals of the period. The only really new thing in filling, outside of the appliances introduced, is the contouring of fillings up to the contact point, or, as Webb called it, "knuckling" the gold. This new method came in with cohesive gold, but it had a long struggle with earlier prejudices, and even now some doubt its value, contending, with some degree of force, that fewer teeth are saved by this process to-day than were saved under the old processes with non-cohesive gold.

The truth or falsity of this position is not of special interest at this writing. It seems, however, that in losing sight of old procedures and adopting the so-called new, the professional mind is giving up much of value and frequently choosing methods that may lead to serious results.

A recent writer says, "One other point in cavity building has been gaining ground slowly but surely. It has been called the "convenience form," or the cutting away of tooth-structure until we get an outline of the cavity that makes it easy of access. Indeed, cavities should be so constructed that all the walls are easily approached. All honor to the older operators who strugled so hard to conserve tooth-structure, retain frail walls, and construct peculiarly shaped pluggers, that those cavities might be filled with some degree of perfectness. . . . Now we seek to prepare cavities easy of access with all points conveniently reached." This sounds very like the instruction received by the students of dentistry in 1834.

While this quotation seems to be in exact accord with the year, the author of it probably played upon it another meaning; neither does extension for prevention mean exactly that which was held to be true under the non-cohesive method of filling teeth. While it combines the practice of a former period in cutting down frail

walls, and also cutting for space, it extends this to the removal of sound tissue to meet possible future ravages of decay. This may be illustrated by extending a small cavity on the proximate surface of an incisor to and above the gingival border and the cutting away of the occlusal surface of a molar whether decay exists on that surface or not. It seems to the writer that this proceeding will not stand the test of time.

With all due respect to the ideas thus outlined, and at the risk of being considered a fossil, the writer feels that to make this method a success means wide separations. If these are made, as formerly, by the chisel there could be no criticism, for to attempt to fill a tooth properly without access to all portions of the cavity is simply an impossibility. While this is generally recognized as true, the modern operator proceeds by a combination of methods that seem to the writer to have in them an element of danger. Separations must be made, but how? The operator at the close of the nineteenth century says, "Place in between the teeth a separator and use force until sufficient room has been obtained." He fails to tell us what the effect of that force may be, and is generally quite indifferent as to pathological results. He should know that to secure space sufficient on proximate surfaces of teeth will require a movement of at least two millimetres. Consider for a moment what this means. The pericementum yields but slightly to pressure, and any increase of force must necessarily drive the alveolar process out of its natural position. The tendency of teeth is to move in the direction of the force applied, and will continue to move in the line of least resistance until a positive irregularity supervenes. This is not ordinarily applicable to the posterior teeth, but is a serious matter with the incisors, especially the laterals. It seems also to have been forgotten that the *extension* of the separation may mean extension of the inflammation produced by the force applied and the possibility of a resulting necrosis of the alveolar plate in anæmic subjects. The separator has a limit of usefulness, as well as the chisel; but the latter properly and intelligently used can do better and quicker work and with less pain to the patient than any separator, whether that be by screw force, cotton, gutta-percha, or wedges.

The writer previously quoted pats the ancients on the back figuratively and literally when he writes, "All honor to the older operators who strove so hard to *conserve tooth-structure, retain*

frail walls, and construct peculiarly shaped pluggers." This would be quite important information if it were true. The "older operators" did exactly the opposite, and cut and filed to an extent that would have horrified the conservator of tissue of the present period. The workers towards the close of the first half of the nineteenth century thoroughly believed in the extension of a cavity to render its filling not only easy but possible, and to prevent future decay,—extension for prevention. Then came a period succeeding this when conservatism prevailed, and this led to the use of the violent force to which allusion has been made.

The object of this article is not to treat this subject to the extent it deserves, but to call attention to the tendency to inaccurate statements and wrong thinking. The necessity for closer study of the past history of dentistry is every day becoming more and more apparent. It is unfortunate that the real record of facts is not always obtainable, hence the statements of the fossils alluded to should be received not only with respect, but as a means of accurately determining the status of the dental profession at a period antedating the memory of those actively engaged in the work.

Dentistry in its upward march differs in no respect from all other efforts among civilized peoples, a step forward and a step backward, but each step should and generally does mean improvement, the old becoming the new and the new returning in part to the old and again advancing spirally to that perfection which should be the aim of all truly professional men.

Bibliography.

FACTS, FAIDS, AND FANCIES ABOUT TEETH. Compiled and Edited by Henry Lovejoy Ambler, M.S., D.D.S., M.D., Dean of Dental Department and Professor of Operative Dentistry and Dental Hygiene, Western Reserve University, etc. Illustrations by W. L. Evans. The Helman-Taylor Company, Cleveland, 1900.

This book of three hundred and ten pages has been compiled by the editor with the object of presenting "the witty and humorous sayings gathered from all sources while at home and

abroad, during many years of professional life." For those who love jokes and prefer to always live in an atmosphere of jollity, this book will be found a mine of good things, but to those who regard professional work as worthy the most dignified treatment, this collection will not appeal. While it is true that it is not wise to dwell continually upon the serious side of life, it is equally true that he who would elevate his profession must avoid giving countenance to anything that would lower the tone of those who practise it.

It has been the work of many decades to raise the dental profession from the ill-disguised contempt involved in the expression "tooth-puller." To give, therefore, the poor jokes of the "space writer" a permanent setting is simply lowering the dental profession to the level of this original standard set up by the laity of that period. Why endeavor to perpetuate these things and add to them pictures well fitted for *Puck*? The writer does not question the motive of the editor. Judging from his stand-point, his work is worthy of commendation, but from the professional it is extremely distasteful. If we are to rise worthy of the honors the doctorate confers, these squibs of a really contemptuous age must be consigned to oblivion.

Having written this much by way of criticism, it is a pleasure to turn to the latter part of the book, under the title "History of Dentistry and Miscellaneous Items." Here are many interesting paragraphs and quotations collected that might profitably be extended.

The attention of the editor is called to a seeming error on page 227, where he states that "In 1844 S. S. White began the production of porcelain teeth in Philadelphia." This is true so far as the foundation of that great house is concerned, but it leaves the impression that the manufacture of these teeth commercially began then. Samuel W. Stockton, some years prior to this date,—1836,—was a large manufacturer of porcelain teeth. He was an uncle of Samuel Stockton White, and the latter was originally engaged in the manufacture with the former.

The illustrations of the book, judged by the humorous standard, are extremely good and exhibit more real wit than any portion of the text.

NOTES ON THE TREATMENT OF IRREGULARITIES IN POSITION OF THE TEETH. By J. F. Colyer, I.R.C.P., M.R.C.S., I.D.S., Dental Surgeon to the Dental Hospital of London, Dental Surgeon to Charing Cross Hospital, and Lecturer on Dental Surgery in the Medical School. Published by The Dental Manufacturing Co., Limited. London, 1900.

There is no better evidence of the progress made in dentistry than the fact that in the last decade the number of books upon special subjects have multiplied to an extent that it is now possible to possess a respectable library covering all the branches into which dentistry has been subdivided. In no one of these has there been more rapid development than in orthodontia.

The subject-matter of this work of the author "formed the basis of a series of lectures given to dental students at Charing Cross Hospital during the early part of last year." The book is profusely illustrated with skiagrams and engravings, leaving little to be desired in this respect.

The author, in discussing the age of the patient, says, as we all know, that "the difficulty of moving and retaining the teeth in a new position, increases with the age. As a rule, it is not advisable to attempt correction of irregular teeth by mechanical means in adults." While the difficulty of moving teeth increases with age, it seems unreasonable to confine regulation to children.

The methods described on pages 26 and 27, in which rubber and wood are recommended, carries one back to a period when these were considered indispensable in the movement of a certain class of irregularities; but why illustrate the manner of use now when better methods in the application of force have taken their place?

There is probably no branch of dental work where a wider latitude of opinion and practice may be tolerated than in the regulating of teeth, and as this interesting and carefully prepared book is read, the temptation is constantly presented of stopping to criticise opinions and practice not consistent with the writer's judgment.

It is impossible, however, to agree with the author's views upon the extraction of teeth to correct irregularity. While this is recognized as a valuable aid in overcoming a difficulty, it should be made use of sparingly, and then only with well-considered judgment. The following quotations will illustrate the author's idea.

"The first permanent molars are filled or treated in the manner best calculated to retain them until the second permanent molars have erupted. The crowding of the upper and lower incisors is then relieved by the removal of the four deciduous canines. If the teeth erupt in the normal way, the first and second premolars will come into good position. . . . We shall have to deal with a fairly simple irregularity,—namely, the canines high in the arch. To make room for the canines the first permanent molars should be removed directly the second permanent molars are fairly through the gums." This seems to the reviewer as an effort to remove one irregularity by substituting another. The malposition of the second molar is practically assured by this practice, together with the entire destruction of normal articulation. In regard to treatment of "crowding resulting in the exclusion of laterals from the arch," the author gives this advice: "The advisability of sacrificing a lateral incisor in the treatment of crowding is constantly disputed. . . . The principal argument urged against the removal of this tooth is that the canine erupts next the central. . . . Is it better to have a canine in correct alignment next to the central and the premolar in apposition to the canine or lateral in a mal-direction, with, possibly, its cutting edge tilted forward and the canine sloping towards the median line, and in all probability short?" The illustration given represents the two laterals immediately posterior to the canines and centrals, with considerable space between centrals and canines. If extraction must be resorted to in such presentations, the removal of the first premolar would be proper in order to save the lateral. There is no disfigurement more pronounced, especially in a woman, than canines aligned with centrals.

Space does not permit further notice of this book. It seems to the reviewer to lack systematic treatment, and shows a poverty of mechanical appliances somewhat surprising. It certainly in this respect compares unfavorably with works by American authors. The illustrations are one of the best features of the book and clearly indicate the points explained in the text.

While the reviewer is forced to differ frequently with the teaching of this author, he recognizes it as a valuable addition to the literature of the subject. It offers methods of comparison between the practice regarded as satisfactory in the dentistry of England and that regarded as producing the best results in this country.

The care with which this book has been prepared, both in illustrations, press-work, and type, merits positive commendation. It is a satisfaction as well as a pleasure to read and review works in which all details are carefully considered.

Obituary.

MANILA DENTAL SOCIETY.

RESOLUTION ON THE DEATH OF DR. THEODORE MENGES.

THE Manila Dental Society, numbering among its members former associates and pupils of Dr. Theodore Menges, have learnt with great sorrow of his demise while yet in the prime of manhood, and at a meeting held this day have adapted the following resolution, of which a copy is ordered to be spread upon the minutes of the Society, one to be sent to his sorrowing widow and others to the dental journals of the United States:

WHEREAS, Our departed friend, by his untiring energy, by his constant devotion to duty, has done more than his share for the uplifting of dental education in the United States; and

WHEREAS, A host of his former pupils have each and all lost not merely a teacher but a true friend, adviser, and counsellor, whose constant aim was the betterment of their condition; now therefore, be it

Resolved, That in his death the dental profession has lost one whose efforts on her behalf have always been elevating; his former pupils have lost a worthy friend, his wife has been bereaved of a loving husband and constant companion, that with all of these we sympathize and mourn, keenly feeling while far away from our homes and friends, that in his passing away we, too, have lost.

RESOLUTION ON THE DEATH OF DR. GEORGE B. CUSHING.

The intelligence having been received by the members of the dental profession of Manila that the spirit of the venerable Dr. George B. Cushing has passed away, and recognizing the great loss to the dental profession by reason of his death, and furthermore feeling that the beneficent influence of his long and useful career as a practitioner and teacher are operative in even this distant

land, the members of the Manila Dental Society have come together to do honor to his memory, and have adopted the following resolution:

WHEREAS, The Almighty in His infinite wisdom has spared the life of our friend and teacher until, though past the allotted life of man, he was still in possession of the strength and power of mind to be serviceable as a teacher; and

WHEREAS, The world is better by reason of his busy life, the dental profession richer in her store of knowledge, and the hearts of his friends sorrowful in the consciousness of his departure from among them; now therefore, be it

Resolved, That the members of this Society, by this action, add their tribute to his worth, express their sincere and heartfelt sympathy to his bereaved family and to the dental profession of the United States, and that this resolution be entered of record, a copy be sent to the family of the deceased and to the dental journals for publication.

LOUIS OTTOFY,
W. G. SKIDMORE,
LLOYD R. HAWLEY,
Committee.

MANILA, P. I., August 6, 1900.

DR. J. W. CLOWES.

QUIETLY and almost unknown Dr. J. W. Clowes, one of New York's well-known and much-honored veterans, passed from earth September 9. The doctor had been out of health for the past two years, but kept in sight of his office until about eight months ago, when he sold his residence on Fifth Avenue and removed to a more retired part of the city, One Hundred and Seventeenth Street, facing the attractive neighborhood of the New Columbia College. Although he fitted his office for active service, his strength rapidly failed, so that he was forced to set aside all hopes of again entering into practice.

Dr. Clowes was one that loved his calling in a larger sense than most practitioners. Although he had filled out full fifty years of active practice, he found it hard to say, It is finished, and we may say it was well finished.

Many think seventy-nine years too old for dental practice. Some men grow old mentally more rapidly than others.

Dr. Clowes had two strong features in his practice,—an extreme operation for the removal of the first permanent molars; the large use of an amalgam, "Causeway," for supplying the loss of teeth. This he patented and regarded it of great value. It was a marvel of painstaking industry. His views in regard to methods may be found in dental literature.

In society work he was active, and he had the faculty of expressing himself with clearness.

His office furniture had the air of taste, no expense being spared.

While Dr. Clowes was termed the "millionaire dentist," he always denied the charge, asserting, "I am not, but I have sufficient for the comfortable maintenance of my family."

He studied his profession with his late brother-in-law, J. Smith Dodge, Sr., long known in New York. Dr. Clowes practised in New London, Conn., Columbus, Ga., and in New York. For a year he had an office with the late Dr. Atkinson, in order that he might become familiar with the latter's ideas and methods of practice.

Dr. Clowes's emphatic defence of amalgam has done much to bring it to a better recognition and value as a material for filling and saving teeth. His following has been of a class of people that held very tenaciously to him so long as he was able to serve them. He was fond of exhibiting his many letters received from grateful patients. Who can say that these do not bring much pleasure and solid comfort to a faithful practitioner?

All who knew Dr. Clowes can speak truthfully of his sincerity and faithfulness, while they may not altogether endorse some of his extreme views in practice.

The death of Dr. Clowes was not generally known owing to the general absence from the city at this period of the year.

It is but little that we can say of such a man as we follow him to the tomb. He has had his need of praise in many ways. Some are apt to think, later in life, that they are not fully appreciated, but all such worthy workers as Dr. Clowes have a full reward in the consciousness of having done their full duty.

G. ALLEN MINA.

Domestic Correspondence.

ON METHODS OF APPLYING SILVER NITRATE.

TO THE EDITOR:

SIR,—In reply to Dr. Neeper's letter in the June number and to inquiries addressed to me, I would like to state in the JOURNAL some of the methods that have been suggested and found useful of applying this silver salt to decaying tooth tissue.

Dr. Stebbins when he advocated the use of this agent suggested the use of a pointed stick, moistened in the saliva or in water, touched to the powdered salt, to carry the adhering particles to the wet cavity, and there rub them around gently till dissolved and brought into contact with the whole of the decayed surface. I think no more effective method than this has been suggested, but facility of application may be increased by using a piece of wire set in a handle instead of a stick, as the wire can be bent as required to make access easy to remote cavities. Some have found the use of a solution of the salt, in which pellets of cotton can be moistened, more convenient for general use, and I do not think any better way of keeping such solution has been suggested than that spoken of by Dr. McNaughton at the meeting of the New York Institute of Stomatology and published in the April number of the JOURNAL, —namely, keeping a bottle nearly full of cotton saturated with a strong solution of silver nitrate, and then moistening pellets of cotton by pressing them against the saturated cotton in the vial.

The suggestion to fuse the crystals of silver nitrate on the end of a wire was originally made, I think, to facilitate treatment of pyorrhœa pockets with the salt. Quite a bulb of the fused salt can be made to adhere to the end of a wire by heating it and touching it repeatedly to small crystals and passing them through a flame to fuse them. This method of application affords facility of treating pockets of decayed surfaces, but it presupposes a surface covered with moisture to which it is to be applied in order that solution of the salt may take place on contact.

I have found it desirable to dry the parts outside of and around the place to be treated, in order that a flowing over of the caustic

solution may not occur. I seldom dry cavities, but am careful to dry the mouth and soft tissues near the point of application; and after holding the mouth, so as to permit the action of the salt solution on the decayed surface, for fifteen to thirty seconds, I absorb the surplus solution from the cavity before directing the patient to rinse the mouth. This prevents the mouth and perhaps the fauces from being irritated.

I have not found the caustic action on gum tissue to be a serious matter. In treating cavities that extend to the gum, I wipe away the caustic solution from the gum as soon as the whitening effects of its contact is observed. Of course the gum could often be protected by using rubber dam, but without it I have not found the damage to the gum, resulting from the unavoidable action of silver nitrate in treating cervical cavities, to be nearly so damaging to that tissue as the preparation of cavities and introduction and finishing of fillings would generally effect.

The results of treating decayed tooth tissue with silver nitrate appear to be due entirely to the chemical transformation of the decalcified tissue into a new and stable compound. When the thickness of the strata of disintegrated dentine is considerable the action of the nitrate solution should be continued relatively longer in order to permit saturation of the deeper layers; otherwise renewal of the carious process is liable to occur under the superficial portion that has been rendered stable. I think that when the decalcified tissue is acted on, all the way through to the sound dentine under it, that the place so treated is always rendered inactive for a long period, but care should be exercised to avoid such treatment of cavities of such depth as to permit a dangerous approach of the caustic to the pulp.

J. MOWAN HOWE.

Current News.

DENTAL COMMISSIONERS OF CONNECTICUT.

The Dental Commissioners of Connecticut will meet at the Capitol in Hartford, Tuesday, Wednesday, and Thursday, November 13, 14, and 15, 1900, to examine candidates for license and attend to any business proper to come before them.

The written theoretic examination Tuesday and Wednesday, November 13 and 14.

Practical examination in operative and prosthetic dentistry at nine o'clock, Thursday, November 15.

All persons desiring to practise dentistry in this State must apply to the Recorder for *revised rules* and for the proper blanks. Blanks must be carefully filled in and sworn to and with the fee, twenty-five dollars (\$25.00), filed with the Recorder at least one week before the day of examination.

GEO. L. PARMELE, M.D., D.M.D.,
Dental Commissioner and Recorder.

HARTFORD, September 15, 1900.

INSTITUTE OF DENTAL PEDAGOGICS.

THE seventh meeting of the Institute of Dental Pedagogics will be held in Nashville, at the Maxwell House, beginning at ten o'clock, Thursday, December 27, 1900, and will continue three days.

The programme will be forwarded to all the journals in time for publication in the December issues. Every one interested in Dental teaching should feel it his duty to attend, as it is his privilege to speak on any subject on the programme.

The interest of last year will be maintained, and the plan of developing thoroughly a few topics given a trial.

A most cordial invitation is extended to all, especially to those who are teachers.

HENRY W. MORGAN,
D. M. CATTELL,
W. E. WILMOTT,
Executive Committee.

THE
International Dental Journal.

VOL. XXI.

DECEMBER, 1900.

No. 12.

Original Communications.¹

SOME GERMAN LITERATURE OF INTEREST TO THE
PROFESSION.²

BY WILLIAM H. POTTER, D.M.D., BOSTON, MASS.

No one can come in contact with the intellectual life of the German-speaking nations without realizing that it is one of the greatest powers in the mental world. This intellectual life is developed by a thorough primary, secondary, and higher education, and is favored by a capacity for minute and prolonged investigation which seems to be born into the German mind. Hence the literature of such a people must always be of value to the student.

It has commonly been taken for granted that, however much the Germans, or, for that matter, all Europeans, may be looked up to in most branches of learning, in the science of dentistry little or nothing was to be learned from them. Before accepting this supposition as true, we ought to separate the science of dentistry into two divisions,—the theoretical, or intellectual, and the practical, or operative.

While it is true that the object of the science of dentistry is to

¹The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

²Read before the American Academy of Dental Science, October 3, 1900.

produce practical operations, yet practical work is always founded upon theoretical knowledge, and can only advance with the advance of theoretical knowledge. It is not well, then, to look slightly upon the purely theoretical side of the profession. It seems probable that the practical side of our science has been and probably always will be farther advanced in our own country than in any other place. I am not so sure, however, that we can always claim leadership in matters pertaining to the theoretical or purely intellectual division.

From the observations which I was able last winter to make in Berlin and Vienna, it seemed to me that the men who were being trained for the practice of dentistry in the universities there located were better fitted by thorough preliminary education, and through well-conducted scientific education, to deal with the theoretical or purely scientific part of our profession than we. At the University of Vienna the dental student must graduate in medicine first, and then enter the dental department. He is a thoroughly trained scientific man, competent to undertake the most difficult scientific problems connected with the science of dentistry. His skill in the practical side of dentistry depends upon his own aptitude and inclination. No specified course is required for practical work, and there is little probability that he will acquire the technical skill which is common among the graduates of our best schools.

Let me tell you how I became acquainted with one book which I wish to present to your attention to-night. Wishing to inspect the dental department of the University of Vienna, and having no letters of introduction to men connected with it, I looked up the department in the catalogue of the University. Here I found it represented by five courses given at the "Zahnärztliches Institut," and from the catalogue I decided that Dr. Julius Scheff was the leading man. So one afternoon, just before the time at which this gentleman was put down for a lecture, I presented myself at the dental school and handed in my card. I was soon ushered into the private room of Dr. Scheff and very cordially received by him, after having introduced myself as an American dentist, and as being connected with the dental department of Harvard University. After a few minutes conversation Dr. Scheff introduced me to his assistant, Dr. Rudolf Loos.

Dr. Loos very politely showed me about the operating-rooms so that I could see the students at work, and then invited me into

his laboratory. Here he brought out some very interesting sections of the upper and under jaw. These sections were both horizontal and vertical; the vertical sections included the tooth-structure as well as the bony structure, no soft tissues being included in the sections. After showing me the sections, he handed me a book which he had written on the "Anatomical Construction of the under Jaw as a Foundation for the Mechanics of Extraction."¹ And it is this book which I wish to call to your attention first.

I cannot give a better idea of the book than by going over the various heads into which the subject is divided. After a description of the general features of the under jaw there comes a chapter entitled "The Topographical Relation of the Alveoli to the so-called 'Plates' of the Jaw." We next come to "the relations of the alveoli to one another and to the division walls." A chapter on "A Comparison of the Vertical and Cross Sections of the Under Jaw" brings out many interesting anatomical relations of the root at different levels with the spongiosa and the outer wall plates. After the foregoing intimate study of the tissues of the inferior maxillary bone, and the position of the roots of the teeth in these tissues, the subject of the mechanics of extraction is next entered upon. Each tooth is separately considered, and from the anatomical position of the root in reference to the spongiosa and the dense outside plates the direction of least resistance is determined, and the force applied accordingly.

After a consideration of the use of the forceps as an instrument for extraction, Dr. Loos comes to a consideration of the elevator. I feel sure from personal observation that Dr. Loos has a fondness for this kind of instrument, and I have seen him use it with skill.

In concluding my remarks upon this book I wish to call attention to its thoroughness. It is intended as a guide to practical work, and yet in order to teach how to extract a tooth it begins with a minute treatment of the architectural anatomy of the lower jaw. It deals with the relations of hard and soft tissues, and the manner in which each part throughout its entire length is placed in regard to these tissues.

After having thoroughly gone over the foundation knowledge,

¹ Der anatomische Bau des Unterkiefers als Grundlage der Extraktionsmechanik, von Dr. Rudolf Loos, Assistent am anatomischen Institut der K. K. Universität, Wien.

it then applies it for the purpose in hand. To me the book has its chief interest as a study in anatomy, though its practical side is also important.

The second book which I would call to your attention is one on "The Affections of the Mouth,"¹ by J. Mikulicz and W. Kümmel. This book contains a very complete description of the pathological conditions to be found in the oral cavity. I was especially interested in reading the long chapter devoted to syphilis of the mouth, and the short chapter on the affection called "Lingua geographica," or "Annulus migrans." This affection of the tongue is one which we as practitioners often meet, and I have no doubt often wonder as to its significance. The subject is here very completely treated and an excellent photograph of a case is given.

A third book which I will present to you to-night is upon "The Topographical Anatomy of the Head and Neck,"² by Zuckerkandl. Professor Zuckerkandl is one of the principal men in the anatomical department of the University of Vienna, and his book recently published is full of finely executed plates covering the oral cavity and all adjacent parts. Two of the dissections shown in this book I had duplicated, and brought them home with others for the teaching department of the Harvard Dental School.

The same author has also written a valuable book upon "The Anatomy of the Oral Cavity with Special Regard to the Teeth."³ This work was published in 1891, and is a careful and complete treatment of the subject.

STATE DENTAL EXAMINING BOARDS AND THEIR QUESTIONS.⁴

BY WILLIAM H. TRUEMAN, D.D.S., PHILADELPHIA.

THE advent and the evolution of the State Dental Examining Boards has not proved, either to the profession or to the community, wholly good or thoroughly bad. In so far as they were designed to

¹ Die Krankheiten des Mundes, von J. Mikulicz und W. Kümmel, Breslau.

² Atlas der topographischen Anatomie des Menschen, von Professor Dr. E. Zuckerkandl.

³ Anatomie der Mundhöhle mit besonderer Berücksichtigung der Zähne, von Professor Dr. E. Zuckerkandl.

⁴ Read before the Academy of Stomatology, October 23, 1900.

enforce that those who held forth to practise the science and the art of dentistry should prior thereto pursue a suitable course of instruction, they have accomplished much. Unfortunately, however, knowledge and honesty, intelligence and integrity, are not always close associates. While the Boards have the power to enforce a suitable course of instruction, and to demand evidence of knowledge and ability, neither they nor the schools can compel the use of it. The college diploma and the certificate of the State Dental Examining Board may hang side by side in places of business where but few skilful operations are performed and but little honest work done. The disreputable practitioner, since the State Dental Examining Boards have taken in hand to supervise and rerate the college graduates, is able to assert, in his various advertising devices, that not only is every operator in his employ a graduate from one of the best dental colleges in the world, but each one has in addition thereto a certificate endorsing his skill and acquirements as a dental surgeon, issued by the State Dental Examining Board after a rigid and thorough examination. Who can gainsay this assertion? Who of the general public would for a moment hesitate to place himself for dental services, unreservedly, in the hands of one so highly recommended?

The State Dental Examining Boards have thus tended to make disreputable practitioners appear reputable; and instead of protecting members of the community from their wiles, they have been instrumental in throwing dust in their eyes.

The first service rendered the profession by the State Dental Examining Boards was that which tended to discount the private preceptor and lead the profession and the public to a better and more general appreciation of the advantages offered by a thorough, systematic, and well-arranged course of instruction by well-qualified teachers. They led the profession and the public to appreciate the advantages offered by the dental schools well provided with the necessary apparatus and appliances for teaching the practice and theory of dental science in all its bearings. They explained, by their examinations, the limited capacity of the preceptor as a teacher, in comparison with a college faculty composed of practitioners, recognised by the profession as skilful and well qualified to teach that branch of dental science they made their chief concern. Regardless of the future, this first service, discrediting the private preceptor's certificate and dignifying the dental college

diploma, will ever remain the State Dental Examining Board's most creditable work.

The selection and appointment of examiners was, in Pennsylvania, the duty of the State Dental Society. This Society, then young and vigorous, had in its membership a sufficient number of practitioners to justly consider itself the representative of the profession within the State. The first examining boards had the power to confer upon any applicant meeting their approval, after an examination lasting but a few hours, the same legal rights that otherwise could be acquired only by attendance of many months at a dental college, entailing an expense, for tuition alone, far greater than the trifling examination fee. It was felt to be a matter of serious moment to select for this important office, in justice to the students and the schools and in justice to the community, men of recognized ability and sound judgment, men who were closely in touch and in full sympathy with our educational institutions, in order to insure that their licensees, those who successfully passed their examinations, were, as nearly as could be, considering their lack of training, the equal of a college graduate. It was thought advantageous to have upon the board one or more members of a college faculty, so that they, experienced in teaching and experienced in estimating fitness, could, at critical points, foil those shortcomings from which none closely confined to office practice are free. This also gave to the board tone and character; it inspired confidence; it assisted very materially in bringing to pass the legal requirement of a dental diploma.

The passing of the private preceptor was thought by many to complete the work of the examining boards, and so it did, in so far as the judicious use of the power and confidence reposed in them had, as was intended, impressed on the student that working for a college diploma was better than depending upon the decision of a board adverse to admitting into the profession any who were indisposed to avail themselves of the legitimate means provided therefor.

About this time there was a general waking up in educational matters throughout the world. So general was this revival that all educational concerns, from the kindergarten to the highest schools, classical and professional, felt its impress. It so stirred up our English friends that they were able by a supreme effort to brush aside heretofore unsurmountable obstacles, and so overcome the

inertia imposed by a long series of bitter disappointments as to repeat in their own bailiwick, in much the same way, that which we had so successfully accomplished more than a score of years before. Unfortunately, in so doing they laid the foundation for much turmoil in our educational matters, and gave added excuse for the examining boards throughout the land to enter a new rôle, a rôle presenting many new, complicated, and perplexing problems.

It was in this wise:

In order to make visible distinct to the community the dividing line between those who were and those who were not educationally qualified to enter, or having entered to remain accepted and recognized members of the dental profession, with a right to its designating title, there had been a wise and thoughtful compromise between the schools and the boards. A permanent grading up on the one side and a temporary grading down on the other, in order that eventually the legitimate D.D.S., or its equivalent, should prevail. As was intended, this educational advance (it was an educational advance, the beginning of that which is now so much in evidence) placed the dental profession upon a higher level. This appeared to the public an evidence of marked prosperity. Nothing more natural than that it should be followed by an increasing eagerness to enter the ranks. Preparatory to a still further advance, in order to secure harmonious action the examining boards formed a representative National Association, an example followed a year later by the college faculties, with the same object in view. Primarily, the sole object of each was to mutually assist in a general advance the times called for and opportunity fully warranted. Very early, dissensions arose between these two representative bodies, equally anxious to advance and in perfect harmony regarding the means. The trouble was, which should lead. Between the point of view of a member of a dental examining board and a member of a dental college faculty, as regards this question, there is a vast difference, a difference few stop to consider, and yet it is a difference we must all, in justice, not only consider but respect. Even an ideal member of an examining board assumes, in performing his duties, no personal responsibility. He can, at will, end at any moment his term of office with no pecuniary loss to himself or his fellows; and with but little undisturbance his place can be promptly and acceptably filled. He has no reputa-

tion to make or sustain for himself, his colleagues, or his office. No lengthy preparation or study is required, and no expense, save it may be for the purchase of a few quiz books. He is not called upon to sacrifice his present or prospective private practice. The office, when attained, represents merely the favor of his friends or a little effort on his part soliciting votes. Not so with a member of a college faculty. He assumes a personal and pecuniary responsibility. He assumes to sustain the reputation his college has been years in acquiring. He has his own reputation to make in a new *rôle*, and stands shoulder to shoulder with his fellows, sharing with them success or failure and all that success or failure stands for. Not only do his new duties call for long and careful preparation and constant study, but over and above all, they call for a serious sacrifice of private practice, present and prospective. He cannot step in and out of his professorship as jauntily and care-free as can a member of a dental examining board. All this entails legitimate questions of a business character no one has warrant to belittle or to set aside.

For many years, as all veterans in the service too well know, a professorship in a dental college had proved an "expensive luxury." It was eminently wise and proper that those upon whose shoulders the responsibility rested should profit by past experience; should desire to advance slowly; should exercise the caution and discretion of careful, honest business men; and hesitate, until assured that the profession on which they depended for support was ready and willing to follow with substantial aid, before making changes, possibly inviting disaster. Well would it have been had the examining boards, when urging the faculties to extensive and radical changes, taken these matters more into account. Well would it have been had the commercial spirit, which like the trickling ichor from a foul ulcer, corroding and corrupting all it touches, been held in check while this question was being settled.

The profession was gathering itself for a strong and vigorous leap. The public was beginning as never before to appreciate the value of its services in promoting comfort, health, and happiness. It was coming to the fore as a means of livelihood, offering tempting opportunities to those ambitious to accept and receive, on broader lines than those recognized by the slaves of the yardstick and the scale-pan. Men of other and baser mould, others who had missed the golden opportunity which comes but once, and others,

again, who had lost through passing years the elasticity of youth, saw nothing in all this but fewer and lessened foes as their fevered imaginations conjured a swarm of competitors around them. They became clamorous for restrictive measures. It was to these a godsend when the General Medical Council of Great Britain announced that the British dental license must be earned in British dental schools. A godsend to the disgruntled here; a welcome godsend to the profession there. It was the making of it. It raised their schools to the same prominence to which ours had been raised by the first dental examining boards. The professional schools are the life, the blood, the manhood of the profession. The profession begins when they begin, grows as they grow, and dies when they die. So thought the General Medical Council of Great Britain.

It was in the air, on the other side, that the American dental college was without a peer; that the British dental schools were of no account. To overturn these prejudices on other than commercial grounds was a delicate task; a task the astute diplomacy of the General Medical Council of Great Britain met and adroitly mastered. Owing to the contentious state of affairs which had long existed, our brethren across the sea were compelled to take with their first breath as a legally recognized profession a most nauseous dose of ignorance and ethical depravity. Taking advantage of the disgust which this naturally created, the Medical Council, having at heart the building up of British dental schools, said, "We have ignorance enough, we will have no more. We close the doors to all uneducated men. Our own schools we can control, they shall demand educated men, and we will recognize no other." It was, under the circumstances, a taking expression, well conceived, and accomplished fully and completely the desired end. It was interpreted on this side as a reflection upon the educational standard of our own dental colleges, and proved to the disgruntled a sweet morsel. To them anything was acceptable; a higher entrance or a sheriff's sale. Anything that promised to restrict the "college output," as they, true to their commercial instincts, termed it. They ranted and raved at the diagram the low standard of the American colleges had brought upon the heretofore false name of American dentistry,—whatever that may be; of higher education and higher fees; of the grinding competition of the college clinics, berating the commercialism of dental colleges and dental college professors, until at times their impassioned and fren-

tic appeals for this and that made the dental meeting more like a corner in some ill-conditioned bedlam than a company of professional gentleman discussing their affairs.

One after another the nations of Europe, as a measure to protect "home industries," following the example of Great Britain, refused legal recognition to any but graduates of their own schools. The open door of American dental graduates, of interest to one in a thousand only, was tightly closed. Had those who raised the cry about the discrediting of American dental diplomas been thoughtful readers; had they watched the course of events as portrayed in the journals, they would have known that educational matters contributed to this result, not a feather's weight. American dental colleges, their graduates and diplomas, are credited, respected, and honored the world over to-day as fully and as highly as they ever were. A dentist from the United States is as highly thought of as a dentist, and as warmly welcomed as a professional brother, as ever before. It is only as a competitor that he receives the cold shoulder. The only discrediting the American dental colleges, their graduates and diplomas, have ever received has been in and by the dental societies of the United States. The so-called exclusion has served, however, as many another untruth has served, as a war cry; as an additional excuse for the examining boards to take a fresh start, in a new *rôle*, on a vastly different basis. It was educational; it became commercial. It was conceived to build up, to foster, to widen the field and to give increased importance and value to a well-earned degree. Having accomplished this, in an unguarded moment a mob gained control. It has since essayed to break down, to hamper, to narrow, and belittle the work, the means, and the men their predecessors had labored so earnestly to assist and sustain. Men, educationally incompetent; others, mentally unfitted to form fair and just decisions; and others again, ambitious to be leaders, recklessly aggressive, aping the wiles of social and political agitators, obtained the ascendancy. They catered to the drones and the improvident, the incompetent and the indifferent; holding out alluring schemes to secure by legal or repressive measures that which comes only as the reward of earnest, well-directed, persistent efforts. Under this influence the harmony between the educating bodies and the boards was broken. Far more disastrous, however, has been the effect upon the professional societies. Those who looked upon them for post-graduate instruction,

or as a means to ripen their experience by comparing and contrasting it with that of others, soon tired of the ill-tempered harangues which displaced scientific discussions; and new-comers were repelled by the constant sneering at colleges from which they had just graduated. It thus came to pass, naturally, that, as the State societies selected the members of the examining boards, the control of the boards passed into the hands of men who had made themselves conspicuous in this unseemly strife, and who sought the office as a vantage ground from which to fight the colleges.

The aggressive policy of the National Association of Dental Examiners reached high-water-mark at the thirteenth annual session, held at Saratoga, beginning August 3, 1896. The official report, published in the *Dental Digest*, vol. ii., 1896, pages 544, 614, 625, and 734, read in connection with the next annual report in the same journal (vol. iii., 1897, pages 112, 588, 696, 717, and 834), is interesting as showing the character and intentions of this organization. At the session of 1896 they first ruled, "That hereafter all boards, members of this Association, accept the list of reputable colleges of the National Association of Dental Examiners as the official list of their respective States." It was understood, although not plainly expressed, that all State boards, members of the National Association, should consider themselves obligated to obtain, as soon as possible, legal recognition of the National body by their respective States. Later, Dr. G. Charleston Brown presented the following resolution, which was passed: "*Resolved*, That colleges recognized by the National Association of Dental Examiners be required to place on their annual announcements and catalogues the fact that they are on the list of colleges recognized by the National Association of Dental Examiners."

At a later stage, the Association adopted a set of "Rules and Conditions for obtaining and maintaining recognition of dental colleges by the National Association of Dental Examiners," in which, as prominently and as forcibly as was in purely educational requirements, this resolution was incorporated as follows: "No college shall be in the list of recognized colleges which does not state in its annual announcements that it complies with the rules and conditions of the National Association of Dental Examiners."

This piece of bombastic folly proved their Waterloo. The colleges very properly refused to recognize an authority that existed

only in their inflated imaginations. Could they have succeeded in carrying out the programme here outlined, these doughty leaders might soon have had the dental profession in the United States as thoroughly organized on up-to-date trade union lines as was once the Knights of St. Crispin.

There was no excuse for all this. The aim of these men (apart from their ambition to be considered leaders), set forth plainly in their contributions to the professional journals, was simply and solely to restrict, as a means of reducing competition. The colleges, by far the greater number of them, were managed by men with well-deserved reputations as zealous workers for the public good, men who were carrying on our scientific investigations, devoting, unstintedly, their time, money, and talents to increase the resources of the dental profession. The dental college graduates were being yearly drawn from better men, and were yearly being better educated and trained. The colleges were keeping well to the fore, and were fully meeting the reasonable expectations of the profession.

In proof of this, I point to their crowded classes. In proof that the profession was with the colleges, I draw attention to the fact, too plainly seen to be disputed, that every dental society that has espoused the cause of the element the aggressive examining boards stand for has suffered by it. The great body of the profession has sufficient intelligence to discriminate, unerringly, between the men who work and the men who talk.

I now ask your attention to the questions of the examining boards. By these we are able to judge, fairly well, the mental and educational fitness of the examiners to ascertain and pass upon the ability of the candidate, on other points than those embraced by practical work. The ability to ascertain and judge correctly is the vital point on which the usefulness of examining boards wholly depends. Are they competent to examine and to judge? To so examine and to judge that, on the one side the community is protected (in so far as this provision of dental law is effective) from incompetent practitioners, and on the other side, that no competent candidate is deprived of just and honestly earned rights? To pass an incompetent applicant is a blunder; to reject one competent, and thus deprive the community of valuable services and the applicant of that which means so much, is a crime. On the competency and the honesty of the examining boards depends the

vast difference between a useful service and a farce. These examinations can be made of great educational value, or they can be made as ineffective as those of the civil service in the hands of a political machine. They can be made to serve or defeat the best interests of the profession. It all depends upon the men behind the questions. The standard of the examination must be the preamble to the dental law. Its one purpose, to weed out incompetency. Any attempt to subvert this will inevitably lead to disaster. The profession must depend upon itself, not the law, for higher attainments.

I am impressed that the purpose of the examination should be to ascertain the candidate's "stock-in-trade," the provision he has made and has at command to meet the varied requirements of a dental practice. Does he understand? Has he a fair working knowledge of the varied conditions he will be called upon to meet, and of the many expedients the art and science of dentistry provides? Has he a sufficient grasp of the underlying, correlated, and collateral sciences to utilize the assistance they now and again may afford?

My study of this subject has impressed me that dental examining boards fail to consider the importance of this. Very few questions, indeed, are so addressed. Such trivial matters as the comparative usefulness of glycerin or water to temper modelling sand, the right way to use borax, the difference between an atom and a molecule, are repeated time and again, as are immaterial questions directed to office and workroom manipulations that appeal to personal preferences only. As between examining boards of different States, I find but little to choose, and would suggest that if a moiety of the time and thought so fruitlessly spent in considering the interstate license question had been given to a comparative study of examining board questions, much of the turmoil over this matter would have been saved. Beyond the fact that some of their questions contain more words misapprehended and incorrectly used, more ungrammatical errors, improperly stated questions, and other blunders (these qualities vary and will continue to vary as the members of the boards change), there is but little to choose between the States that examine. We may admit as substantial claims for preference the differences between the States regarding preliminary requirements and the nature of a dental college diploma. That which is beyond this and rests upon the

real work of an examining board is pharisaical and a mere pretension.

By common consent New York is admitted to have a system of State supervision over educational matters so excellent, so well connected, and so faithfully administered that it is considered a standard. Its dental board has been from the first in excellent hands. It has attended closely to business, taking but little part in dissensions, and has been so open and above-board in all its doings that it well deserves the credit awarded by placing its State in the first rank. It is natural, therefore, to examine its questions first, especially as the official publications of the University of the State of New York, the title under which the State supervising body is known, promptly places us in possession of a full set of questions of every examining body under its charge.¹ The New York Dental Examining Board presents for each subject, at each examination, fifteen questions, requiring answers to ten only. This is an excellent idea, very old and well tested. Not only does it extend the field in which the candidate may prove his ability, but it permits the examiners to suggest new lines of thought to the educators when planning their questions. If it were possible to get upon the examining boards really competent men, men as well qualified for their duties as are those in the college faculties, this would be an exceedingly valuable help in bringing and keeping our educational standards well up to date. So long, however, as the examining boards contain so many inferior men, men blind to their own shortcomings, the faculties will be compelled to occupy the "firing-line" unaided and alone.

With the New York questions, as with most others, those upon subjects other than strictly dental, and on dental subjects somewhat removed from actual practice, questions which may be had "ready-made," selected from the text-books by mere pencilling and allowing the typewriter to do the rest, little or no fault can be found. These sciences change so slowly, and offer so wide a field,

¹ These publications are sold at a nominal price. For list and prices, address University of the State of New York, Albany, N. Y., publication department. In addition to the questions, they contain a great deal of useful and reliable information. College Department Bulletin No. 9, February, 1900, Dentistry, is especially valuable, giving as it does a *résumé* of the dental laws, educational requirements, etc., of all the States.

that by simply taking a few pages at a time, with no mental effort a new and equally good set can be formed for each occasion. When, however, the examiner tries his apprentice hand at improving or changing them, either to escape a consciousness of plagiarism, or to serve some special purpose, then there is another story to tell! He usually puts his foot in it. We have an example of this in the question:

"In what way does absorption of food occur?"¹

In what way, indeed, does absorption of cabbage and beefsteak, pork and beans, "occur"? Occur is a good word to these men. It signifies something that takes place to the nature of an accident; something that comes incidentally, not as the result of design or intention; and, undoubtedly, absorption of food is something far removed from the usual physiological routine. I am somewhat curious to know, however, what answer this examiner has in pickle for the unfortunate dolt who attempts to answer this cunning question.

As we pass to those studies more closely related to dental science, where the examiner feels impelled to originate rather than copy, the poverty of resources, and the extreme mental poverty of the examining board of this, the standard State, is painfully in evidence. The questions themselves are, many of them, trifling. When touching the practical work of the office and laboratory, they are mere reflections of personal opinion and experience. One examiner is an ardent new departurite, and sings it in wherever possible. His favorite, used six times in less than two years,² reads as follows:

"In the fusion of the metals for making dental alloys, describe the process used to prevent the volatilization of the tin, zinc, etc."

He recently referred to this, berating the colleges because, although he had, he says, for a score of years taught the profession

¹ University of the State of New York, Bulletin No. 14, August, 1887, page 452, question No. 6.

² University of the State of New York, Professional Examination papers: 1898, page 241, question No. 12, examination May 14, 1899; 1898, page 242, question No. 12, examination June 11, 1899; 1899, page 67, question No. 12, examination September 18, 1899; 1899, page 68, question No. 11, examination January 24, 1900; 1899, page 68, question No. 14, examination April 6, 1899; 1899, page 113, question No. 3, examination September 27, 1899.

the right way, more than half of the dental college graduates who came before him either avoided or wrongly answered this question.¹ The vast difference between volatilization and oxidation this learned examiner failed to grasp.

I not only criticise the character of the questions, but that they are so frequently repeated with but insignificant changes. So often is this done, that any one committing to memory the answers to a few sets, knowing nothing more of the subjects embraced, would stand a fair chance of passing the examination. It may naturally be asked, regarding these and other like questions, Why, if they are so simple, do so many students fail? The mental poverty of the examiners, as shown by their questions, is a sufficient answer. They have, to all these stereotyped questions, stereotyped answers. Any answers returned that do not correspond with these, however correct, are, of course, considered wrong. The questions are framed within the narrow field of their own personal opinion and experience, without regard to the text-books or the teaching of the schools. Likewise, the answers.

We have a type of this in the question:²

"How should a cavity be treated and filled when the dentine is highly inflamed?"

The question of inflamed dentine is an unsettled one. It is, and has long been, a matter of dispute among our ablest investigators. At present the weight of evidence favors the idea that inflamed dentine is not a correct expression. With so much to choose from, what right has a dental examiner to enforce his own opinions by including in his questions these disputed matters?

I give from the Ohio Dental Examining Board questions of the examination, May, 1900, a sample question. These, published in the *Ohio Dental Journal*, July, 1900, page 344, have been collated, mainly, from those used in New York. It is, I am impressed, a distinct advantage in favor of the examiners for the critic to criticise their published questions; these have, in the publication, passed an editorial supervision, and doubtless their most glaring

¹ INTERNATIONAL DENTAL JOURNAL, vol. xx., May, 1899, page 286; Items of Interest, vol. xxii., February, 1900, page 121; Ibid., March, 1900, page 179.

² University of the State of New York, Examination Bulletin No. 14, August, 1897, page 467, question 14.

errors have been corrected. The question selected, I presume, is original with the board.

"Give a characteristic action on amalgam in dental alloys, of each, silver, tin, antimony, zinc, and copper."

I frankly admit, I have not yet learned "the characteristic action of silver, etc., on amalgam in dental alloys."

The Maryland Board presents us with two nuts to crack:¹

"What is meant by metallo-plastic work?"

"What is meant by stannus-plastic work?"

Who, besides the examiner, knows? Where did he get these terms?

I have a few choice specimens from those of the Virginia State Board. They are from original papers used at the examination held in June, 1900. The two words, "etiology" and "growth," are not misspelled; they are good dictionary words if the dictionary is old enough. They may have been taken from one brought over by the Jamestown Fathers.² Let me ask, however, Why are these old and uncommon words used in dental examinations? Do they serve any honest purpose in protecting the community from incompetent dentists? Or are they used for the economical purpose of keeping down competition by misleading some poor fellow more nervous or less perceptive than his brothers?

The question papers before me, from which I copy, were used by a candidate at this examination. I have six only, and am informed that one has been mislaid. They are neatly gotten up, but many of the questions are awkwardly worded; as seems to be the custom more or less with all dental examining boards, as though anything were good enough for a student; for instance:

"Give minute structure of enamel."

The fourth, fifth, and sixth, on histology, are given in this style. They would have been more dignified if the more expressive word "describe" had been used instead of "give."

The second question of this series is more objectionable:

"By what are the teeth retained in their sockets, and give description of it."

¹ *American Journal of Dental Science*, vol. XXV, July, 1898, page 141.

² Growth, for growth, I now and again meet with in words two or three hundred years old. It probably is here by accident or coincidence. Etiology, and slight variations of it, is still used, mostly by medical writers. Atiology and aitiology are unusual. Etiology is by far the better form when used as an English word.

How much better, and how much more explicit, to say, By what are the teeth retained in their sockets? Describe it.

The first question on Operative Dentistry is a stupid one:

"Give treatment of alveola abscess about the point externally."

The third: "Describe the treatment of fungous growth of dental pulp?"

The questions on Prosthetic Dentistry are examples of word jumbling. The first question:

"In examining the mouth for the insertion of an artificial denture, what should be taken into account as to all its conditions and the first two objects to be attained."

The fifth reads:

"How many kinds of plates are used for dentures and upon what do they depend."

Does he refer to the forms of plates, or the material of which they are made? I think it would trouble a Virginia lawyer to find out what this examiner had in view when penning these two questions. There is but one properly worded question in the series, and that is marred by a misspelled word. An examiner who presents at a dental examination such trash would feel very small, indeed, if made to face a witty attorney, and be examined on these questions, in a suit to show cause for rejecting his client.

The fourth question on *Materia Medica* reads:

"How would you treat the acute poisoning of carbolic acid?"

It will be observed, the wording of the question implies that the acid has been unfortunate; it has been poisoned; and the examiner asks, How should it be treated? If the acid were mine, I would not treat it at all, but discard it. In the first and third questions on Pathology and Therapeutics we find the word "ætiology." While not obsolete, this particular form is so nearly so in dental literature that a well-informed dentist would be quite excusable if he failed to recognize it. The seventh question of this series is another jumble:

"Describe the pathological condition sometimes found analogous to loss of tooth-structure by attrition."

What does he mean? Does he ask for a description of a pathological condition that occasionally resembles attrition, or one resembling attrition at all times, but rarely met with?

I consider it a gross insult to put before a candidate asking the right to practise dentistry a jumble of words like this. I consider

it a disgrace to the profession that such incoherent sentences are so often found masquerading as examination questions. It is adding insult to injury to taunt those who fail to understand such stuff as this, by ascribing the failure to their ignorance. In these six question papers, in eighteen instances the interrogation point is either wrongfully used or omitted; in as many more instances, punctuation marks needful to make sense are omitted. I say, needful to make sense—nothing under the sun could make sense of some of these questions.

We will now come nearer home, and consider the questions of our own examining board. I regret to say that we have here nothing to be proud of. It is a very great pity that there is not a more kindly feeling between the educational and examining bodies. I am very sure any one in close touch with the colleges and the instruction there given could have expunged from these questions, at least, their most humiliating features. There seems to be a disposition to use unusual words in place of those in common use, always, of course, incorrectly; so far so in many cases as to obscure the real import of the question, or to render it ambiguous or wholly unintelligible. No care is taken to make the questions clear cut and direct; the words are often jumbled, with no regard to grammatical or euphonious sequence. A common error is in confusing the separate parts of a question by omitting needful punctuation marks, or using an improper connecting word, or uniting into one question words that properly should be formed into two. Take, for instance, the question:¹

"What is a tendon and its function?"

There is no such thing as "a tendon and its function" known to anatomical science. Why it should be so written passes understanding. What is a tendon? What is its function? is a properly put question. Jumbling the two ideas together indicates either ignorance or design. Another objectionable feature is addressing the questions personally: How would you do this and so? They would be right and proper as addressed to men of experience; but addressed to men just out of college, not yet admitted to practice, it is absurd. You there want to know what he has in store; you want to know if he understands possible conditions he may have to

¹ Report of the Dental Council of Pennsylvania, 1897-98, April, 1898, examination, page 18, Anatomy and Physiology, question No. 3.

meet; and how they may, can, or should be treated. The expert witness style, presenting a supposable case and asking an opinion, is absurd enough in a lawyer's hands, and usually considered there a time-killing device.

In treating a diseased condition, or in outlining a course of treatment, the presence of the patient, the seeing of actual conditions, is far more important than anything spoken or written. There is not a question, proper to be asked, that needs be personally addressed. Another fault is that of addressing questions to *practices* and not to *principles*. Why cannot eighteen carat gold plate be soldered with twenty carat solder? seems, from its frequent repetition, to be a favorite with all examining boards; and what a ridiculous one it is! Make the alloy platinum, and one carat gold plate can be soldered with twenty-four carat solder without the slightest difficulty. If the examiners realized the important work they have in hand, and what it means to pass or reject wrongfully, we would have none of this.

Again, there is thoughtlessness in changing the questions. For instance, December, 1897, the question is asked:

"How are the nutrient products of digestion taken up and carried to the circulation?"¹

April, 1898, this is thoughtlessly changed so as to make it appear new, and made to read:

"When and how are the products of digestion finally incorporated into the tissues?" regardless of the fact that by far the larger portion of the products of digestion pass through the anus and other excretory channels. The examiner should have known that the fæces, the urine, etc., are as truly products of digestion as is the more nutrient chyle.

There are some questions of doubtful propriety on scientific grounds; for instance:

"In how many and what bones are the teeth located?"²

Can the alveolar process, anatomically speaking, be called a bone?

"Explain how it is that heat both oxidizes certain metals and deoxidizes their oxides."³

¹ Report of the Dental Council of Pennsylvania, 1897-98, pages 15 and 18.

² Special Dental Anatomy, December, 1897, question 1.

³ Chemistry, June, 1898, question 2.

Heat does not oxidize; nothing in the world can oxidize but oxygen.

"Of what class of articulation is that between a tooth and its maxillary, and how is it lubricated?"¹

Whether the relation of the tooth to its socket warrants the term articulation or not is a disputed point. The examiner evidently thinks it does. But what does he mean by the expression "a tooth and its maxillary"? Maxillary is usually considered an adjective. His suggestion regarding "lubrication" may be a permissible "catch," but in this decidedly faulty question it is absurd.

"How does tissue outside of the circulations receive its nourishment?"²

We have the arterial, venous, capillary, cell to cell, and lymphatic circulations. Outside of these, how can any tissue receive nourishment? I was curious to know what construction the examiner put upon this question, and for that purpose obtained a typewritten transcript of a student's answers. The student was evidently at sea, but amid a few lines of meaningless words had a little to say of capillaries and cells, and the answer was marked ten! I have no doubt but that the candidate understood how tissues were nourished; but, What of his examiner?

"In what parts of the body, and how, is heat generated?"³

This question would have been all right half a century ago. It seems based upon the now discarded theories, regarding animal heat, of Lavoisier and his followers.

Some questions are so carelessly written that they fail to convey the idea intended; for instance:

"How would you bring a superior lateral incisor into position that strikes inside the lower teeth?"⁴

The insertion of a comma after position, or, better still, rearranging the words so as to read, How would you bring a superior lateral incisor that strikes inside the lower teeth into position? makes of this faulty question one readily understood.

¹ *Anatomy, Physiology, and Special Dental Anatomy*, April, 1900, question 8.

² *Ibid.*, June, 1900, question 6.

³ *Ibid.*, June, 1900, question 7.

⁴ *Principles and Practice of Operative and Prosthetic Dentistry*, May, 1900, question 7.

“Describe and give the supposed causes for Hutchinsons teeth.”¹

What is here called for? If a description and the cause of Hutchinson’s teeth, it should read, Describe Hutchinson’s teeth, and give the supposed cause.

“Describe the Kidneys and their functional operation.”²

How much better to say, Describe the kidneys, and their functions.

“Describe the more minute structures which evolve the sense of taste.”³

“Evolve” is incorrect. It expresses the idea of growing out of; something coming from something else. It should read, Describe the minute (more minute, if you like) structures in which are located the sense of taste.

“What is meant by the pathology and morbid anatomy of a disease?”⁴

What is meant by pathology and morbid anatomy? is a good question; adding to it “of a disease” makes it absurd.

I find in all dental examination questions, not only of this State, but all that I have examined, an inexcusable carelessness in wording and punctuation. In this respect they are a marked contrast to questions from other examining bodies with which I have compared them; notably those of the Medical Board and those prepared by the school-master for the recent preliminary examinations in this State. The only typographical error in the full series of the last named has been corrected with a pen. All the questions are correct; they have but one meaning; it is a pleasure to read them.

The questions for the May and June (1900) Dental Examinations of this State are distinctly worse than those of previous years, mainly in being marred by incorrect spelling of technical names; for instance, question 9, *Materia Medica* (June examination), calls for three drugs useful in the treatment of “empyemia of autrum.” Other errors of spelling are less misleading, but none the less inexcusable. A large majority of the questions are in need of the school-

¹ Dental Pathology and Bacteriology, May, 1900, question 2.

² Anatomy, Physiology, and Special Dental Anatomy, June, 1900, question 4.

³ Dental Histology and Dental Physiology, June, 1900, question 6.

⁴ Dental Pathology and Bacteriology, June, 1900, question 4.

master's attention; this is true, however, of all that I have examined as prepared by dental examining boards. The examining board business has been in the past, and is now in some States, conducted in such a star-chamber fashion, by boards, some of them, claiming to be higher than the appointing power, that supervision has been unlooked for; and the work has been done in a slipshod, none-of-your-business sort of a way, as these specimen questions before you plainly show. They are specimens only; they can be duplicated by the score.

I would most earnestly urge upon those elected to serve upon dental examining boards, that when getting their bit of quiz books they add a good modern unabridged dictionary, a good work on English synonyms (that by George Crabb is excellent), and an elementary work on English grammar; and that they make free use of them. They then might avoid such blunders as that in question 2, Anatomy and Physiology, June, 1898,—“What muscles are involved in respiration?” Not a muscle in the human body but what is involved in respiration, although but few are concerned. Better by far stick closely to well-understood, good old-fashioned common words, than to become involved and evasive, indeed, seduced, superinduced, and induced, by a demented lot of absurd nonsense.

Is it too much to ask that the questions placed before dental students in the examination halls shall be prepared with the same care as would be an article intended for a dental journal? It is no excuse to say that many of the most noticeable blunders are typographical. They may, some of them, have been so; but when they are distributed, uncorrected, to those about to be examined, they then become the questions of the examining board, and the examining board that has accepted and distributed them must shoulder all their errors of every kind and character. They are *their* blunders.

The method of selecting men for this office is faulty. The favorite plan of the State society, nominating two or more, from which number the appointing power ordains one, will never command the best men. It implies that the appointing power is incapable of judging fitness. No man of standing, reputation, and self-respect will willingly permit himself to be a candidate in competition with another, and have his fitness for the position passed upon by a power acknowledged to be incapable of justly deciding. It is objectionable, also, in making unpleasant, on account of red-

ing for the election of a "straw" opponent, the reappointment of an acceptable and well-tried examiner; unless there is a provision, as in New York State, where failure to select a candidate is considered equivalent to expressing a desire that the incumbent be reappointed for another term. It ought, however, to be legally so stated. If the appointing power is capable of judging at all, it should be unhampered. If the responsibility is laid on the State society, its selection should be definite and final. Responsibility should rest somewhere. It is the duty of the State society to require from the boards they either nominate or appoint a report of all their doings, and publish in their annual reports a full list of the questions asked at each examination held, with the name of the examiner responsible for each set. "The board" is a soulless, intangible thing. The society would then know who were and who were not, qualified for the position. As it is now, the societies are compelled to "go it blind." You see the result in the questions placed before you. These are from boards open and honorable enough to make their questions known. You can rest assured that those of the star-chamber concerns are infinitely worse.

Are they the work of illiterates, or trade unionists? Is it carelessness, or cunningness? Are we to accept the authors of these questions as the best men the societies can select, to stand guard at the profession's portals, to protect its educational interests?

Our own board says, in their report,¹ "The board of examiners has been painfully impressed by the lamentably insufficient preliminary education of many of the applicants for examination, as evidenced by the written answers to the questions propounded to them. They not only fail to understand the simplest questions, but are unable adequately to express their answers." Are these questions before you from that same board samples of the simple questions referred to?

Now, gentlemen, in conclusion. What value has an examination conducted by men so careless or illiterate as are the authors of these questions? Have these men been selected for their fitness? Are they the best men the State societies can produce? Are we to accept them as representative of the intelligence, of the educational standing of the societies whose choice they are? How long will the profession tolerate examining boards whose questions invite

¹ Report of the Dental Council of Pennsylvania, 1897-98, page 6.

derision and disgust, and who make the profession a laughing-stock for well-informed, educated men?

The time has come to see to it that this important position is filled by competent, up-to-date men; men who know enough to conduct a proper examination, or know enough to know that they do not know, and are willing to merely superintend, leaving the real work in abler hands. If this cannot be done, let the farce end.

PROPHYLAXIS IN DENTISTRY.¹

BY D. D. SMITH, D.D.S., M.D.

It was the privilege of the author to first present the subject-matter of this paper before the Washington City Dental Society, February 24, 1898. The talk then made was afterwards elaborated and presented as a paper before the Northwestern Dental Society at Hartford, Conn., in October of the same year. This paper was published in the *INTERNATIONAL DENTAL JOURNAL*, January, 1899. The theories then timidly advanced having in experimental practice apparently congealed into concrete principles, it seems fitting and appropriate that the matter should be brought in a formal manner to the notice of this Academy, for the significance attaching to the principles herein enunciated should command the most serious attention from the reflective and earnest minds of the profession.

Whilst it is not a written declaration of dentistry, there is nevertheless a distinct impression emanating from dental literature and dental teachings, to the effect that any advancement in dentistry must be either through improved mechanisms, new materials, or new methods of operating; in other words, there always has been and still is given to the mechanics of dentistry a decided preponderance of energy and effort.

It has been the good fortune of the author, while seeking an interpretation of certain phenomena which are always attendant upon the more common dental lesions, to be led out of the beaten

¹ Read before the Philadelphia Academy of Stomatology, June 28, 1900.

paths of thought and effort and into investigations for the betterment of the teeth, in distinctively opposite ways and by distinctively opposing methods. The results of these investigations and experiments, like the methods employed in producing them, are wholly antipodal to the present thought of the profession; hence they are brought to your notice, and thus to the dental profession, with a degree of hesitancy and with some trepidation.

It is my belief and conviction, that when the secrets of the etiology of caries of the teeth shall be clearly unfolded, the inevitable conclusion will be that to *tooth environment* rather than to structural composition, is due by far the larger percentage of dental troubles. In the article on this subject published in the *INTERNATIONAL DENTAL JOURNAL*, January, 1899, by the author, the *manner* of tooth destruction through decay was fully and, as we believe, for the first time definitely and clearly set forth. Firmly convinced of the impregnable nature of these propositions, my efforts have centred upon means and methods for producing and maintaining the most perfect attainable isolation of the teeth from concomitant agencies of decay.

Special foods and methods of infant-feeding for the production of structural tooth resistance ever have been and must continue practically abortive; and especially so as affecting aggregations or any considerable numbers suffering from defective dentures; hence no investigations were made in this direction. The very pinnacle of absurdity in this field seems to have been attained at a recent dental meeting in Richmond, when, in criticising certain measures for compulsory teachings respecting the teeth and the enforcement of methods of caring for them in the public schools, one gentleman maintained that the wiser and better course would be for dentists to teach physicians (!) the proper methods of attending to the dentition of children; for physicians, having in their charge the "little stomachs" of the children, could prescribe and regulate food for them and thus maintain good digestion and consequently produce good teeth. This incident is introduced here to give emphasis to the impracticability of *any* systematic regulation of children's diet, and because it so plainly illustrates the *reductio ad absurdum* of the proposition that a physician's care or any special feeding will, or can, effect systemic assimilation of special articles of food to the production of structurally good teeth. Given food in proper quantity and in variety

such as is ordinarily found in the home of an American family, the system will unerringly appropriate the elements required for tooth-building, through the same elective affinities that obtain in the consolidation of other tissues, and by no other means. The important work devolving on the physician or dentist is to so control environment during the eruptive stage and thereafter (a matter reasonably within the province of either profession), that the formative processes exhibited in the activities of the pulp shall not be hindered or disturbed by adverse chemical agencies acting upon the erupted parts of the tooth.

Dr. Williams, of London, whose writings have been received with considerable favor in this country, in a letter to *House of Interest*, said, "I have repeatedly pointed out that in my judgment the greatest hope for the future in saving human teeth lies in the direction of the prevention of decay by the use of germicides." The inadequacy of this proposition will be plainly seen when we consider that decay in human teeth is by far the most controllable affection to which they are subject; that bacteria is but one of several causes of decay; and if it were the one and only cause of decay and other troubles of the teeth, there has yet been discovered no effective germicide which can be safely used in the mouth. The same writer says further upon this subject: "In my own practice I have relied chiefly upon a strong solution of hydronaphthol in oil of cassia. . . . This I use freely in all cavities, and then before filling I use a varnish of Canada balsam in chloroform in which there is ten per cent. hydronaphthol. My patients use a dentifrice in which hydronaphthol and oil of cassia were the principal germicides. Decay in many instances has been almost entirely arrested." Although Dr. Williams may have relied on these agents in his own practice, until we are given further and more specific information respecting the action of "hydronaphthol in oil of cassia," and some reliable data relating to the efficiency of their germicidal properties, as well as the practicability of their use in dentifrices and mouth-washes, we cannot feel any assurance whatever that in these agents we have any valuable addition to the present long list of so-called germicidal nostrums urgently seeking recognition. Whilst germicidal washes may possibly be made of some value, at present they fall very far short of meeting the requirements for the prevention of tooth decay.

If the generally accepted theories respecting the causes of caries

are correct, among which the presence of bacteria and their products stands most prominent, it necessarily follows that *environment* is the important factor governing decay of the teeth; and to systematically enforce a complete and positive change from bad to good in the mouth and about the teeth is a method of prophylaxis both efficient and safe.

The practice conceived, suggested, and instituted by the author, briefly stated, consists in thorough removal at frequent and regular intervals—once every month has thus far proved most satisfactory—of all accumulations, whether solids, inspissated secretions, semi-solids, or bacterial formations, from *all* the exposed surfaces of the teeth, leaving the enamel, or whatever of the tooth may be uncovered, thoroughly polished, and thus in the best condition to avoid hurtful deposits and equally to favor all efforts of the patient in the direction of cleanliness.

It is readily demonstrable that to maintain true cleanliness in the mouth, even on the part of the most painstaking, is impracticable, if not impossible, without the direction and assistance of an intelligent and expert operator. There are the calcific deposits, constantly increasing; the more immediately hurtful acidulated bacterial accumulations; inspissated mucus retaining decomposing particles of food and furnishing most favorable conditions for bacterial culture; besides these there are irregularities and certain formations and positions inaccessible to all ordinary methods of cleansing, which implies the perpetual retention of matter inimical to the teeth and gums. These injurious accumulations, with their equally injurious emanations, hitherto overlooked and disregarded by physician or dentist, are not only causes of decay, but are equally causes of recession of gums and absorption of alveolar structure; the latter condition much more to be dreaded than simple decay of the teeth.

Recognition will yet be made of the important fact that to the *presence* rather than to the quantity of foreign matter on and about the teeth the beginnings of pyorrhœa are wholly attributable; and the deleterious influence of a breath perpetually loaded with offensive emanations from this source—especially at seasons of salivary inactivity, as during sleep—will, we believe, ere long be disclosed as an important factor in many pulmonary and digestive disorders, and will be taken account of in medical diagnosis and treatment.

The prophylactic treatment advocated in this paper for the prevention and for the relief of those and other conditions has been found to be not only possible, but its feasibility has been clearly demonstrated. I have described the process more commonly as cleaning the teeth, but there is a wide distinction between the ordinary methods of cleaning the teeth and the system of prophylactic treatment herein contemplated. The difference is: first, in appliances and methods; second, in extent and thoroughness of the operation; third, in the persistence and frequency of the treatment; fourth, in the object sought—the prevention both of decay and pyorrhea—and in the results attained.

When necessary, scalers should first be used for the removal of solid deposits and such mucous concretions as may have been the means of softening or causing a partial decalcification of cervical enamel. Following this, the teeth should be thoroughly polished on *all* exposed surfaces,—the labial, buccal, palatal, lingual, mesial, distal, and, in cases of developing teeth, the occlusal as well. The hand-polishing with stick and pumice should reach to every exposed portion of the tooth, and be continued until the touch, which can be educated in this matter to distinguish better than the eye, gives evidence of thorough cleansing and polishing. The operation is best done with properly shaped orange-wood sticks charged with powdered pumice-stone. The prepared orange-wood is most conveniently handled and carried to positions desired by means of a Jacke porte-polisher made after a modified pattern given into the hands of J. W. Ivory, of whom they can be purchased.

The grit of the not too finely powdered pumice has been found best adapted for removing viscid, mucoid accumulations and for polishing enamel surfaces; and what is even more important, the friction of the stick and pumice as applied by hand—for power polishers should never be used—arouse to excite or stimulate the vital forces of the tooth to increased activity in the removal of waste and the deposit of new and better material. The effect seems like massage treatment for muscular tissue.

The benefits resulting from this treatment are marked and readily seen, and extend to all parts of the teeth. Whilst the deciduous and young permanent teeth are most responsive, all classes of teeth and teeth of all ages are peculiarly benefited by the treatment, as is plainly shown in them after a few months of regular and careful massaging. There are striking exhibitions of improve-

ment in color; of change in enamel, from an opaque appearance or condition to that of ivory-like translucency; of apparent increase in density, and a general improvement denoting a condition of decay-resisting structure,—changes which have impressed and even astonished the author as perhaps no other results from operations on the teeth, or in the mouth, have ever done.

Of the about forty cases of all ages which have come regularly under a system of monthly treatment during the past two years, there has been no case of new decay which could not be readily accounted for, neither has there been an instance of beginning pyorrhœa or other pathological condition of the gums. I have under observation now cases of the greatest interest, where the dark yellowish stains in cementum and dentine just above the enamel, and white spots under the enamel, denoting defective nutrition, are beginning to take on a better condition. The yellow is being replaced by better colored material, and the white spots are disappearing, indicative of resumption of normal nutrition. In every case the enamel under this treatment assumes a more pleasing appearance and seems to take on a more vital condition. Erosion is retarded, if not arrested; and the same may be said of that form of wasting which occurs on the labial and buccal surfaces of the teeth, which Dr. Thompson, in an article in the July, 1900, *Dental Digest*, has mistakenly classed under the head of “mechanical abrasion” due to mechanical friction, the result of too vigorous use of the tooth-brush and too gritty tooth-powders. My observation leads to the conclusion that these channels or grooves cut across upper or lower teeth, just at the gum margins, are *never* the result of mechanical abrasion. They appear in the worst form in situations which preclude abrasion from the use of the brush or from any form of friction. They are due to the mucous secretion, intensified in its chemical action by being mechanically held in contact with the teeth by the lips. This condition is found more commonly in mouths where there is limited action or movement of the lips, either in speaking or laughing, thus presenting little opportunity for commingling of mucus and saliva for the neutralization of the acidity of the former.

We need not dwell upon what may be classed as minor benefits resulting from this treatment, although they are as distinct and positive as are the thwarting of tooth decay and the prevention of pyorrhœa. I close with the bare mention of a few of them: Entire

and frequent change of environment, resulting in a state of cleanliness of the teeth and mouth unapproached by other means; a breath freed from the emanations of offensive matter persistently on the teeth; perfect physiological gum and substructures; enhanced views of the true importance of the teeth, and the employment of more intelligent and effective methods for ordinary cleansing on the part of the patient; familiarizing children and young people with the dental chair and removing the fear of dental operations; teaching and assisting in the proper care of the teeth at the most critical period of teeth existence; relief from the torturing dread of dental operations, and the fulfillment of the designs of nature, in the comfortable use of the natural teeth through to old age.

WHAT DOES IT MEAN?

BY DR. B. F. ARRINGTON, GOLDSBORO, N. C.

IN the *Items of Interest*, August issue, 1900, under the heading "Snap-Shots at the National Association," the first paragraph reads as follows: "The National Association held its annual meeting at Old Point Comfort, the picturesque spot where the supposed amalgamation of the old American and Southern Associations occurred three years ago. The idea of having subdivisions of the Association, to be known as Eastern, Western, and Southern branches, it is well known now, was placed in the constitution as a means of inducing the Southern men to agree to union. From any other view-point the plan is bad, and as neither an Eastern nor a Western branch has ever been organized, it is to be hoped that in the not distant future the Southern men will themselves offer an amendment to the constitution abrogating the branches, in which event we will have a truly representative National Association."

In plain English, this is a frank confession of insincerity, trickery, and unfair dealing. In the interest of all concerned, I will ask, are we to understand by such expressions and open acknowledgment that fraud was premeditated and perpetrated under deceptive disguise to induce agreement to union? As the language quoted reads, such would seem to have been the design and action of some who were zealous in scheming and effort to effect arrange-

ment for the organization of the National and union with the Southern as consummated at Old Point Comfort in 1897.

The expression, "it is well known now," was unfortunate, and reveals an ugly feature, for the presumption is clear and undeniable that if it is well known now, it certainly was well known then, during the planning and scheming for organization and union, at least to some of the active manipulators. It was nothing more nor less than a shameful act of deliberate deception and professional littleness, unworthy of the occasion and the work involved, and can but be censured and repudiated by all honest, fair-minded men in the profession.

A National Association, or any other professional organization, planned and established upon a basis of such trickery and unfair dealing can never succeed in development of grandeur for good.

As regards the expression, "From any other view-point the plan is bad," I will venture the opinion (strictly on a basis of equity) that from that view-point it has not and will not receive favorable consideration; on the contrary, it must be regarded far off the line of correct professional dealing.

That first paragraph of "Snap-Shots" must have been written hastily and rushed to the press-room without due consideration and reflection. In all charity, such we will hope was the case. But until explanation is made the language as recorded will admit of but one construction,—deception and fraudulent intent,—which is to be regretted. In the interest of the profession and for the credit of all concerned, as schemers in arranging for the organization of the National, we will hope there was in the hasty work on "Snap-Shots" some typographical errors that will admit of correction.

We can but hope and believe the spirit and intent of a large majority of the dentists who figured conspicuously for the organization of the National and union with the Southern at Old Point Comfort were honest in purpose, and not in any way participants in the perfidy indicated in the paragraph quoted.

The expressed hope that "in the not distant future the Southern men will themselves offer an amendment to the constitution abrogating the branches" is far fetched. No Southern man, a member of the Southern Dental Association, unless a hireling with a fixed price (there may be such, but I am unwilling to believe it), will ever offer such an amendment under existing circumstances.

To present this subject for consideration was the duty of some member of the Southern Dental Association who had been an active participant in advising and arranging for the union at Old Point Comfort; but as none (so far as I know) have ventured an expression, and by silence seemingly assent to and sanction the statements in "Snap-Shots," I therefore volunteer service, and feel justified in doing so as one of the original organizers of the Southern Dental Association. I must say, it is with sincere regret that I have felt it to be a duty to present and state the subject as above, but have done so from best motives and best wishes in behalf of the true interest of the profession, and for the sake of good feeling and harmony will express the hope that explanation may be made and no cause remain to justify belief that ungenerous and unfair dealing was purposely perpetrated in arranging for union of the Southern and National Associations.

In connection with the above it is legitimate to ask of knowing ones, Why the Eastern and Western Associations, corresponding to the Southern, as branches of the National, have not been organized? It was proclaimed, and distinctly expressed and understood, at the meeting at Old Point, before the organization of the National and union with the Southern was effected, that such organizations were to be established, and it was upon the faith of such understanding that the work of organization and union was successfully effected. This is a fact that no one can truthfully deny. It was even specified what territory each organization should embrace. So far there has been an evident want of good faith in not carrying out the arrangement and agreement as stipulated, and which was confirmed by a majority vote, all believing, or had the right to believe, that good faith and honest purpose was the basis of action. It is to be hoped that an equitable and satisfactory explanation can be offered, and that the National Association (purged and purified as needs may require) may develop into a grand organization for more advanced practical and scientific work and higher attainments in dentistry.

As a member of the Southern and National Associations, I have written the above in the general interest of the profession, hoping to stimulate sentiment and sanction for legitimate and fair dealing in all professional transactions.

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, October 3, 1900, at six o'clock.

A paper was read by William H. Potter, D.M.D., of Boston, entitled "Some German Literature of Interest to the Profession."

(For Dr. Potter's paper, see page 781.)

Dr. Potter.—I am put down on the card to show a dissection of the lower maxilla, and I now present it. I had it made for the Harvard Dental School, in order to be able to show the relation between the contents of the inferior dental canal and the roots of the teeth. You will also notice a dissection of the mental nerve and artery.

There have been one or two cases reported of late where, in lancing an abscess at the end of a lower bicuspid, the mental nerve has been severed; and it seemed to me quite important to have a dissection so that we could impress upon the minds of students the conditions to be met in this region.

It seems to me that the next great advance in dental science will come from the work of the laboratory, and that therefore the scientific side of our profession is of the greatest importance. The treatment of affections of the tooth socket is, in my opinion, the greatest problem which is before us. A treatment based on pure mechanics does not suffice. The problem must be dealt with in the laboratory, by a well-equipped scientific investigator. There are men abroad in the practice of dentistry who seem to me better fitted by education to undertake such work than are we.

DISCUSSION.

President Pond.—The subject is open for discussion.

Dr. Werner.—I envy Dr. Potter for the opportunities, and for the kindly reception that I know he would meet wherever he went in Europe. I think some men over there envied him for his oppor-

tunities for what they think we in America have. Of course, I am enough of a German, and perhaps know enough of Germany, to know that they have some very scientific men there. Their best talent there is the best talent; at least, there is none better. I think, as he does, that it is the men in the laboratories, the men who have that broad education in general medicine, who are going to be the means of advancing our specialty in years to come, further than any other class of men.

And yet I am far from one who underestimates the mechanical, the technique, in dentistry. The mechanical side seems so thoroughly and comprehensively developed that the further advance must come in conjunction with bacteriology and physiological chemistry.

Generally speaking, we have a very vague idea of how dentistry is taught in European schools. My little investigations on my trips there have opened my eyes. There you cannot find a dental school as we know dental schools to have existed in America,—namely, exclusively dental schools. It would seem to them ridiculous in a dental department to teach only the anatomy of the head and neck, and to stop there; it would seem to them the essence of superficialness. Most of our dental schools in America were instituted with very limited medical instruction. Gradually they have developed a broader curriculum, so as to give a thorough training in anatomy, physiology, and chemistry.

In Austria and Germany, and practically in France and Italy and England, the "Zahnarzt," or dental physician, is a person looked up to. He cannot have the title, and cannot put on his sign "Zahnarzt," without his qualification back of it; he would be prosecuted at once, and not by a political board of examiners, as with us in America, but in an entirely different way. While I do not wish to speak slightingly of our State boards of dental examiners, I do think they are wrongly constituted, have too much power, are too much of a political force. They should be differently appointed, and they should have to undergo an examination. The Germans have it nearer. Once examined, not by a political board, but by a board constituted of competent teachers, he is licensed to practise, not in one state, but in the whole empire. Our present board of examiners should be gradually modified in that direction.

Then I know how thoroughly up to date the Germans are in

everything pertaining to bacteriology, physiology, and chemistry. In order to bring our specialty to a higher point, we will need to improve our dental education in bacteriology and physiological chemistry.

I wish Dr. Potter had spoken of many more points that would have been of interest; for I think visits like his, finding out what somebody else has and what he does not have, what he is taught and what he is not taught, is of great benefit to us. It is also a good thing for you and me to see some one else operate, to see his office, to see him do his work. We can learn something from most any one, and perhaps help him to improve in certain directions.

Dr. Baker.—Mr. President, will Dr. Potter explain how this specimen was preserved?

Dr. Potter.—It was preserved in a formalin solution while being dissected; it was sent from Vienna to Boston in a sealed zinc box. There was a small amount of formalin in the box, about half a litre, and the extra room was filled with excelsior. In Boston the specimen was transferred to alcohol. Alcohol hardens a specimen more than does a formalin solution.

In Vienna they use formalin almost exclusively for anatomical specimens. They have great tanks of it, and bring out from them for the day's lecture the required amount of anatomical material, and then put it back to remain for perhaps a year.

Dr. Stevens.—What is the significance of the fringed tongue? Does it signify any disease?

Dr. Potter.—I do not know just what Dr. Stevens means by the fringed tongue. The affection which I have called attention to under the name of "lingua geographica" has no serious signification.

Dr. Stevens.—I thought it had an important signification.

Dr. Potter.—Not what I called lingua geographica.

Dr. Stevens.—It is not syphilis?

Dr. Potter.—The book which I have quoted, "Die Krankheiten des Mundes, von J. Mikulicz und W. Kümmel," says that two writers relate it to syphilis, but that almost all writers say that it has nothing to do with that affection.

Dr. Stevens.—That is what I supposed.

Dr. Potter.—As I remember it, it is that way. Some have thought it was syphilitic, but he considers it rather more interesting than serious.

Dr. Smith.—Does he outline any treatment?

Dr. Potter.—The author quoted says that in such cases treatment is unnecessary.

Dr. Werner.—As I understand it, it is not "fringed tongue," but the geographical or map-like divisions the papillae make, the little grooves that divide them into sections and pictures. I have a family where such a tongue is very distinct, and where there are no signs of syphilitic lesions in the mouth. I have seen it described in German books.

Dr. Fillebrown.—I wish to thank Dr. Potter for what he has done for the Academy and for the profession. I was familiar with the doctor's intention when he went abroad, and took a great interest in his doings while away, and the results which he has brought home justify my expectations. The literature he has brought and his interpretation of its bearing upon our wants are interesting and valuable. The problem of harmonizing and unifying science and practice is really with us a difficult one. Ours is the profession of applied sciences. The problem of our profession to-day is the problem of applying sciences. Dentistry began at the practical end of the subject, and I think there is no question but what that end is well mastered, and, as has been remarked here, our principal improvement is to be in following the paths as they are further marked out by scientific study and scientific application in the laboratory.

I remember some years ago I considered the subject of the "Influence of Culture on Professional Skill." I took the ground then, and I take the ground now, that whatever you do must first be conceived in the mind. You cannot make a figure, you cannot form a letter, or even make a straight line, until the conception is formed in the mind. There is also no question but what the doing reacts upon the mind and aids in perfecting the conception.

And so in the field of dentistry, the farther we go in our scientific applications, the better we can understand our anatomy, our physiology, chemistry, and bacteriology, the truer will be our mental conception, and the better we can carry it out with the hand.

Subject passed.

President Pond.—The next in order of business is "Incidents of practice and presentation of specimens." Has any gentleman anything to offer?

Dr. Potter.—I do not think I can resist showing you a good

syringe. I have always considered the ordinary syringe with leather packing as unfit to use; it is an unclean instrument. Nowadays people are beginning to open their eyes in regard to syringes, and are making syringes which are fit to use in the mouth.

I looked over the syringes for sale in Berlin and Vienna, and found the one which I have here to-night. The piston is entirely made of metal; it is accurately ground to the barrel, and is a satisfactory plunger. Before using the syringe the piston should be touched with vaseline or glycerin. I prefer glycerin because it washes off more easily than vaseline. This syringe can be boiled in all its parts without the slightest injury.

Dr. Baker.—There is no packing in the instrument?

Dr. Potter.—Not the slightest. I wish you would test the instrument. I have used it for several months, and therefore have more confidence in speaking of it.

Dr. Williams.—What is the metal?

Dr. Potter.—The barrel is brass and the plunger nickel.

Dr. Werner.—How often do you boil it?

Dr. Potter.—Every time I use it.

On motion, adjourned.

CHARLES H. TAFT, D.M.D.,
Editor American Academy of Dental Science.

Editorial.

THE LAST MONTH OF THE CENTURY.

It is well at certain fixed periods in the life of the world to draw aside from the rush of contending elements and stop to consider the past as it affects our several relations socially and professionally. The history of the individual is always of interest to the person who can review his life dispassionately, and to the man of years the thoughts naturally turn to reminiscences of the days lived and the experiences that have made that life interesting to him. The individual that cannot treasure his personal experiences, even though these be marked by many mistakes, is incapable of that feeling that makes of the past a foundation upon which to

build for the future. What is true of the individual is more positively true of the world at large and of that nearer, and perhaps dearer, calling which has been to him the support of the life he has lived, and which has brought him not only financial aid, but a personal intercourse with those engaged in the same line of work, and which has made that calling a compensation and a silver lining to the many clouds with which he may have been environed.

When the man of years, in his reminiscent mood, recalls the work done in the past one hundred years, he feels that the progress has been steadily onward. In fact, there is a feeling of self-congratulation that he has been made, actively or passively, a partaker in its progress. It is, perhaps, a trite remark to say that no century can exhibit an equal amount of good work accomplished. This, doubtless, has been said as each century has drawn to its close, and will be said again when those who are now active in this century have ceased from their labors. We, however, can only live *now* day, and it is no reflection upon those who are able to greet the incoming of the new century that they are able to feel a degree of satisfaction that the nineteenth century has been to them, with all the mistakes made, a brilliant epoch and one worthy to go down into history with an enduring record of great things accomplished.

The inspiring influence of mental activity that has pervaded all civilizations has had its effect on every branch of human effort. The active medical professional man has lived to see his calling lifted from the empirical stage almost to that of a science. The dentist is closing his century with the happy consciousness that he has passed through the childhood of his profession and is now standing on firm ground awaiting calmly the new day that seems already breaking along the horizon of the coming era.

Dentistry has much to rejoice over. It grewled in the years of inexperience in the early days of its life. It tottered in its attempt to walk alongside of the older professions. It became the subject of the sneers and wit of the unthinking. It even failed to secure the honest self-respect of those engaged in it. It had no social life among those who followed it; and up to the middle of the century it was without a character. The last fifty years have made it what it is to-day in all civilized centers of the world. While this is true, it would be unjust to those great names who individually struggled with its difficulties in the old and the new world to say they labored with only partial results; but while

honoring these, they were but isolated factors in progress and had but little influence in that great uprising that marked this renaissance,—the new birth of dentistry.

In looking back it is interesting to notice the special advances made and the means whereby this progress has been accomplished. In the front rank must be placed organization. The weakness of previous decades was the result of isolated work. The dentist of the earlier periods knew nothing of association, and no advance was made until this was accomplished. We can, therefore, as the century passes into the dim and shadowy history, stop a moment to recall the name of Horace H. Hayden. No monument is erected to the honor of this man, but while dentistry has failed to remember him in this respect, there remains a warm feeling for the one person who never ceased calling the scattered host to gather together until he succeeded in organizing the first national society of dental surgeons.

Has dentistry properly honored the memory of Chapin A. Harris, the man who, when refused recognition by the medical college of his own city, bravely overcame all difficulties and founded the first college of dental surgery? These two men must never be forgotten as the ages roll on. They doubtless builded better than they knew. It is not probable that they could have measured the vast results that followed their immature efforts; but then it is always thus with the little ripples that disturb the great ocean of life. They create no noise, but eventually they are felt in an ever-widening circle.

Organization and education, then, have been the two factors that have made dentistry worthy of our respect and adoration. He is unworthy to be ranked as one of its disciples who fails to feel the enthusiasm of his profession, or who cares only for the loaves and fishes that may have come to him with but little effort on his part.

The day calls up the names of many who have worthily lived their lives and passed on, but their work remains, and it is upon this we have builded. Some of these stand out prominently in the work of the century. Let no one forget the names of Koecker, Fitch, Maynard, Wells, Arthur, Barnum, Garretson, and Bonwill, of this country, Tomes, of England, and Magitot, of France. These are representative of our illustrious dead, and their work will ever remain the glory of their profession. The progress of the century

does not, however, lie with these alone, but with those living workers who have added even more to that science that has made dentistry worthy to be classed with the older professions. These will be forced to wait for their apotheoses, but let us never forget the thought that made Wells immortal and that developed the next greatest discovery of the century, the cause of dental caries. The names of Wells, of Hartford, Conn., and Miller, of Berlin, will go down to posterity side by side, the one the apostle of humanity and the other the earnest and successful investigator. The one relieved the surgeon's table of its attendant horrors, and the other gave to dentistry a character for scientific research unequalled in his generation.

The changes that have come to dentistry during the past one hundred years have been heretofore alluded to on these pages. They are part of its history, and familiar to all. The mentality that made these possible is of more importance than the results, valuable and important as these have been. To the mind that can reason from effect back to cause it becomes evident that the mental growth of a people is of more importance in the advancing civilizations than the product of that growth, for it proves that the century has advanced in brain-power, and with this properly conserved there can be no backward steps, but well to well there will be continued development and continued progress until the man of to-day will be the pigmy of that future that lies beyond the horizon of the thought of the time.

In bidding a lasting farewell to the century that has bound us in loving bonds, we greet the incoming of the twentieth, and with some measure of prophetic ken can see its possibilities and glory in its yet unborn greatness, its larger measures of life, and its assured professional success.

WHAT WERE THE MOTIVES?

Upon another page will be found an article under the heading, "What does it mean," by Dr. Arrington, of Goldsboro, N. C., in which he takes as a text a quotation from the *Flow of Interest* in regard to the motives actuating the men who closed the career of the American Dental Association and on its ruins formed the present National Dental Association.

The quotation in question says, "The idea of having subdivisions of the Association, to be known as Eastern, Western, and Southern branches, it is well known now was placed in the constitution as a means of inducing the Southern men to agree to union."

Space will not permit a full review of the history of that work, but as the writer was an active and interested participant in it, he can assure both Dr. Arrington and the veracious chronicler in the *Items of Interest* that the motive for the change from the American to a National Association was simply that it had been deemed unwise to continue two, so-called, national organizations, one for the North and the other for the South, and that this opinion was not confined to any one section of the country. The North made a great sacrifice towards harmony in giving up absolutely the American. The South still retained the Southern as a branch. The bonds that bound the members to either association could not be lightly severed. These, however, were not weighed seriously in the balance, and the National Dental Association was organized.

The writer had something to do with the original draft of the constitution, and while not satisfied with it as a whole, he made no captious opposition; neither was the final adoption of that instrument in accordance with his ideas, but at no time could the motives of his colleagues be impugned. The whole effort, from first to last, *was for the good of the dental profession of the United States*, and no one had anything to gain by seeking an opposite course.

The question of the formation of Eastern, Western, and Southern branches of the National body was a more difficult problem.

The writer can answer only for the Eastern. The committee having that in charge met and considered the subject. It could not see its way clear at that time to form an organization as contemplated by the constitution of the National. It was, therefore, postponed to a more satisfactory period. It was very evident that the formation then of a branch would have been exceedingly ill-advised. The National Association was itself on trial, and there were grave doubts as to its permanency. Happily these fears have been dispelled by three successful meetings. It is possible that ultimately the organization of the contemplated branches may be perfected, but it must be apparent that there are now altogether

too many dental associations. With the increase in local, State, and interstate associations, there is a growing tendency to professional weakness. Dentistry is too narrow to admit of such wide extension, and, it must be evident, proper support would not be forthcoming. The opinion of the writer is that we should strengthen those associations now in existence before any attempt is made to organize others.

If the writer in the *Items of Interest* erred through ignorance, he may be pardoned, but if with malicious intent to stir up ill feeling, it cannot be too severely condemned. In any event, it has not a particle of truth to recommend it or to make it worthy the space given.

THE GALVESTON SACRIFICE.

It may seem late to appeal to the dentists of this country for financial aid to our professional brethren sufferers in that fearful inundation now so sadly familiar to all, but it was supposed that professional men were aiding, with their fellow-citizens in other walks of life, to swell the funds being raised, and that to the extent of their financial ability. This was the fact within the writer's immediate observation, as it was presumably so elsewhere.

It is now officially stated that the dentists of that city will not be able to participate in the general fund, as that has been devoted to feeding and clothing and removal of wreckage, and, in any event, is not sufficient to cover more than five per cent. of the loss.

Subscriptions can be sent direct to Dr. D. S. Kibbough, secretary, 2123 Market Street, Galveston, Tex.

DR. CLAPP'S REPLY.

Upon another page of this number will be found Dr. Clapp's reply to an editorial in the September issue of this journal. The pages of the INTERNATIONAL DENTAL JOURNAL are always open to the courteous discussion of all matters of general interest to dentistry. It was established that the dental profession should have a journal for the expression of all shades of opinion untrammelled by commercial or private interests.

It is thought, however, that Dr. Clapp has failed to catch the

drift of the editorial he attempts to criticise. The editor made no effort to narrow his observation to any particular State examining board, but endeavored to show that a general weakness existed in the entire plan of regulating dental practice by the methods adopted. The State board of which Dr. Clapp is an honored member may be all that he claims for it. Whether this be true or not does not, in the slightest degree, invalidate the expressed opinion that the entire system is wrong in principle and worse in practice. It would, therefore, have been more gratifying had Dr. Clapp taken up the whole question and given us solid arguments to controvert the growing sentiment that State examining boards, to be of any value, must be organized upon an altogether different basis from that at present in force. The results are not satisfactory, and, as a whole, are discreditable to an intelligent profession.

CHARGES MADE BY THE NEW JERSEY STATE BOARD.

CONSIDERABLE space upon another page is given to charges made against Dr. Charles A. Meeker, of Newark, N. J. Ordinarily personal conflicts are not acceptable in this journal. This, however, transcends these narrow limits and becomes of general interest both to the dental profession and other State examining boards. The fact that the daily papers have taken hold of it elevates it to the dimension of a public scandal, and greatly to the injury of Dr. Meeker. We have no comments to make upon this case except to assure Dr. Meeker that he is one of the members of State dental examining boards whose reputation for probity has never been questioned, and in whom the writer has a confidence that frivolous charges fail to disturb.

CORRECTION.

THROUGH a misunderstanding, illustrations 1, 2, and 3, accompanying Dr. Allan's paper in the August number, should have been placed with Dr. Weston A. Price's communication in the report, in the same number, of the proceedings of The New York Institute of Stomatology, where they properly belonged.

Bibliography.

MANUAL OF PATHOLOGY, INCLUDING BACTERIOLOGY, THE TECHNIC OF POST-MORTEMS, AND METHODS OF PATHOLOGICAL RESEARCH. By W. M. Lile Coplin, M.D., Professor of Pathology and Bacteriology, Jefferson Medical College, Philadelphia; Pathologist to Jefferson Medical College Hospital, etc., etc. Third Edition, revised and enlarged. With Three Hundred and Thirty Illustrations and Seven Colored Plates. P. Blakiston's Son & Co., Philadelphia, 1900.

This, the third edition of this valuable work, is, as the author states in the preface, not to make it "a treatise or book of reference, but, as its title indicates, a manual that the author hopes may be useful in the laboratory and post-mortem room and in clinical diagnosis by the aid of the microscope." This altogether too modest idea of a book of eight hundred and forty-six pages does not fully give the reviewer's conception of the work. While it is true that it will not satisfy the general reader, in that he will fail to find much there regarded as a necessity in a book of reference, he will, on the other hand, have no cause to complain of the want of lucidity in the descriptions.

Following out the general plan of the book, that of a practical assistant to the study of pathology, the author naturally opens the first chapter with "Technic, Post-Mortem Examinations, Instruments needed." These are fully covered and the necessary instruments carefully illustrated. Following this chapter, in proper order, comes the "Technic of Morbid Histology." This, together with "Bacteriological Technic," is satisfactorily illustrated. The "Illustrations of Various Sediments" is very complete, and should be of great value to the student in differentiating the various presentations under the microscope. The "Technic of Sputum Examinations" follows in regular order, and this closes Part I. and forms the basis for General Pathology in Part II.

The author prefaces this part of the subject by a discussion as to the "Causes of Disease." This is a very clear statement, and is one of the most interesting chapters in the book, dealing, as it does, with all those changes that lead to abnormality in tissue, and

finally to the discussion of immunity to disease, together with the theories connected with this. That absolute immunity rarely exists is a statement that possibly cannot be controverted, for immunity when apparently well assured may be broken down by various methods. The author has given much space to "Bacteria as Causes of Disease." Nothing more fully illustrates the change in the study of Pathology than this extended consideration. The pathological books of a very few years ago gave this but slight attention, and it is within the memory of many when it was practically unknown. It is due to this advanced knowledge that pathological studies have become truly scientific and have raised the general practice of medicine from the empirical stage which it occupied at the early part of the last half of this century. The subject is treated here as fully as could be expected, and this and the following related subject, that of animal parasites, is very satisfactory.

Chapter II. deals with "Hypertrophy, Hyperplasia, Metaplasia, Heteroplasia, Atrophy, Hypoplasia, Agenesis, or Aplasia." This is followed by Chapter III. on "Infiltration and Degeneration," and Chapter IV. on "Necrosis," and Chapter V. on "Circulatory Disturbances;" and then the author opens Chapter VI. with "Inflammation and Repair." He accepts Park's definition of inflammation, which is that given in "Park's Surgery,"—"Inflammation is an expression of the effort made by a given organism to rid itself of or to render inert noxious irritants arising from within or introduced from without." The reviewer is inclined to agree with Stengel that no short definition contains the essence, for inflammation is by no means a simple process. If a definition must be given, that of Burdon Sanderson seems preferable, that inflammation is the "Succession of changes which occur in a living tissue when it is injured, provided that the injury is not of such degree as at once to destroy its structure and vitality." This chapter covers all there is of a practical nature in this condition, and is so far very satisfactory; but the critical reader misses some of the work of many investigators, and he will search in vain for any allusions to the earlier history of this subject. While this may be dead material, the living student cannot appreciate the present advanced position it occupies unless he is made familiar with the work that has preceded this era. It is understood that this could not be expected in a manual, and therefore, while the loss is recognized, it is not stated as a criticism.

The author seems to regard the diapedesis of the leucocyte as the principal origin of pus, although he acknowledges that proliferation may have a certain influence in the production of pus-cells. This older theory of Virchow, so strenuously combated by Conheim and his school, seems not to have lost ground by time, as all pathologists recognize the possibility of two sources of pus, —migration and proliferation.

Space will not permit an extended review of all the chapters of this interesting production, but allusion must be made to Chapter XV., on "Bones and Joints," and to the sub-chapter, "Caries and Necrosis." In this it is stated that "Death of the bone and the process of separation from the living tissue are comparable to the changes already noted as present in soft parts. Where the dead tissue joins the living there appear accumulations of phagocytic cells that attack the osseous matrix forming the line between the dead and living structures and proceed with the separation of the necrotic mass. Many of these cells are clearly leucocytes belonging to the phagocytes already described. Other cells resemble the giant cells." This lucid explanation is far in advance of that usually given in the unmeaning phrase, "That a line of demarcation is formed," etc., without a word as to the cause which separates the dead from the living bone.

While the book will, naturally, appeal more to students of general pathology, those who aim to be stomatologists in fact rather than in name cannot narrow their studies to special pathology; in fact, in this instance the greater includes the less in its enunciation of foundation principles, and without a knowledge of the former the latter cannot be understood. With Dr. Coplin's book as a guide they cannot go far astray, but will follow his teaching with interest and profit.

This book is produced in the usual excellent style of the publishers. The illustrations and colored plates, many of which are original, give additional satisfaction to the reader, and especially are they of value to students, leading to a better comprehension of the subject.

DENTAL METALLURGY. A MANUAL FOR THE USE OF DENTAL STUDENTS AND PRACTITIONERS. By Charles J. Essig, M.D., D.D.S., Professor of Mechanical Dentistry and Metallurgy in the Dental Department of the University of Pennsylvania. Revised by Augustus Koenig, B.S., M.D., Demonstrator of Metallurgy in the Dental Department of the University of Pennsylvania, etc. Fourth Edition, revised and enlarged. Illustrated with Forty-three Engravings. Lea Brothers & Co., Philadelphia and New York.

There is no better evidence of the practical value of a book than repeated editions. It is no test, however, of its scientific value, for it is a notorious fact that the nearer a scientific book approaches originality the slower will be the sale. This is readily accounted for from the fact that the circle of readers must necessarily be limited.

To prepare a book to meet alike the needs of undergraduates and practitioners requires a judicious handling of subjects, the tendency frequently being to write beyond the mental capacity of the one, or, on the other hand, giving too much attention to detail to satisfy the other. It is thought the author of this book has, as a rule, happily avoided this difficulty and given the dental profession a work that will enable both young and old to grasp the subjects upon which it treats.

When this book first appeared it was in advance of the series of dental text-books that have since been issued prolifically from the press. Indeed, it was the first ever issued upon metallurgy in the form of a manual for dental students and practitioners. It was presented before dental colleges had seriously taken up this study, and, doubtless, had much to do with forming professional opinion as to its value as a dental study. It became the pioneer in this work and an incentive to others to write in the same direction. At present all the dental colleges of this country make some attempts to supply the needs of students by establishing metallurgy as part of the curriculum, and some possess elaborate facilities for teaching this very important sub-branch of prosthetic dentistry.

While the foregoing is true of the book as a whole, there are some of the subjects that might be improved by greater elaboration and more attention to detail, and also would have been greatly improved by illustrations. Allusion is here made to the refining of gold and silver. The process is fully stated and sufficiently so

for one practically familiar with the methods used, but it is thought that one untrained in the work would be greatly at a loss to follow the instruction as given. The student needs to be shown the process step by step. In illustration, if he is required to refine scrap or filings, the process should be followed from the first removal of iron from the mass until it finally reaches the ingot from the crucible. The processes detailed are all correct, but lack this special attention to details which marks the experienced teacher when dealing with inexperience.

The book is enriched through the labor of Dr. Augustus Koenig, and also through valuable suggestions by his father, Professor George A. Koenig, M.E., Ph.D., Professor of Chemistry and Metallurgy in the Michigan College of Mines.

DISCOVERY OF ANÆSTHESIA BY HORACE WELLS. Memorial Services at the Fiftieth Anniversary. Patterson & White Company, Philadelphia, 1900.

It may seem strange that six years have been permitted to elapse since the celebration of the discovery of anæsthesia took place, December 11, 1894, before this book was permitted to see the light; but it was regarded by the committee having in charge the preparation of the bust of Horace Wells that the published report should be supplementary to its completion and installation in the Library of the Medical Museum at Washington. The preparation of this consumed more time than was originally anticipated, hence the delay in the appearance of this memorial volume. The dental profession is generally familiar with the proceedings connected with that celebration, through the reports in the dental journals at the time, but as part of the history of this the greatest discovery of the nineteenth century, no dentist can afford to neglect this opportunity to add this memorial volume to his library.

The two principal addresses of that day were that of Professor Fillebrown, of Boston, upon the History of Anæsthesia, a carefully prepared and exhaustive paper and worthy of permanent preservation, and that by Professor James E. Garretson upon Horace Wells.

There is an interest attached to the latter, as it was the last of Dr. Garretson's public efforts, and it seems to the writer to have been one of the most brilliant productions of this remarkable man. It was a tribute from the great surgeon to the man who had made

modern surgery possible. Garretson has passed beyond the activities of earth, but he has left us this address, and, perhaps, the most eloquent and vivid description in the English language of the difference in the amount of suffering before the days of anæsthesia and the relief from pain which followed.

After describing an operation performed by him the day previous for the removal of a tumor which involved the salivary glands, trachea, carotid arteries, jugular vein, and pneumogastric nerves, while the patient was "sleeping and dreaming quietly," he continued: "Consider, in contrast, a picture familiar before the days of Wells's inspiration. A mother, her heart welling out in tears, limbs trembling so as scarcely to afford her support, helpless misery marking her countenance, despair striking at her with its thongs of flame, follows into a hospital operating-amphitheatre a nurse who carries her first-born, which is being brought to the table. Alas! helpless, indeed, is the mother. How more gladly, how a thousand times more than gladly, would she lie down in place of the child. Cries of mother and child moan through the hospital, and the least sensitive feels his cheek pale. The crucial moment has come. The child is placed and held by force upon the table. The mother is torn away. For a single moment eyes of mother and child have met in parting. A loud, frightened, despairing cry from the child rings from ceiling to floor of the room. The mother drops in a heap and is carried out a raving lunatic. She raves about and curses God as being without pity or mercy.

"Let a picture of to-day have relation with that other one of the past. One which extended, alas! from the days of the first surgical performance to the year of grace eighteen hundred and forty-four.

"A mother brings to a hospital a child whose deformity requires the knife for its correction. Conscious of the power of anæsthesia, the surgeon talks to the parent, while all the while the little patient, pleased and inveigled by the sweet smell of chloroform, is itself anæsthetizing itself. The cutting is done. The child has a dream of roses and gardens and wide fields. The mother has placed in her arms her restored offspring. She has no tears, no words; her contact has been alone with beneficence. She is overwhelmed by the mystery met and passed. She says, 'Our Father which art in heaven.' She says and feels there is a God of pity and mercy.

"Look at the name of the maker of these pictures of the new time! It reads, Horace Wells."

The publishers of this volume are to be congratulated upon the tasteful character of the book. It is in every respect worthy the subject.

The presentation of this memorial volume closes the labors of the committee, and it is regarded as a fitting and appropriate tribute from the dentists of America to one of the great benefactors of the human race developed in this century.—Horace Wells.

An excellent reproduction of the bust of Horace Wells is placed as a frontispiece to the volume.

Those desiring the book can procure it by enclosing one dollar to Patterson & White Company, 518 Ludlow Street, Philadelphia, Pa.

Domestic Correspondence.

DR. CLAPP'S REJOINDER.

TO THE EDITOR:

SIR.—Being a member of a State Board of Dental Examiners, I cannot let your editorial, "The Present and Future of State Boards," in the September number of your journal, go unchallenged. So far as my own board is concerned, your statements are in many particulars wrong and your conclusions unjust.

ABSTRACTS FROM EDITORIAL.

"It may seem to some impudic to reopen a controversy with the organizations known by the name of State Boards of Dental Examiners, and this certainly would be untrue had there ever been a permanent peace established between the colleges and those political governing bodies. That, however, has never been the case; the spirit of the hour is that like spirit that produces a more violent volcanic eruption."

"The Boards have all had their usual spring examinations, and a certain per-

DR. CLAPP'S REPLY.

The Massachusetts Board when first appointed, in 1887, was one of those "political governing bodies" referred to.

Of the original appointees, two are still on the board and one died in office after having served for ten years. The other two members resigned.

After an association with those of those gentlemen in board examinations for years, and an acquaintance with the two resigned members for more than twenty years, I can truthfully and

cent. of applicants have been rejected after having passed the various examinations of the college faculties.

"To the average laymen this means a wholesome protection to the public and a renewed assurance of the value of this supervisory care in preventing unqualified men from entering the professional ranks. To the educators behind the examined students, it means simply that these students have succeeded or failed to answer a sufficient number of ten or a dozen questions in each branch. The success does not secure the dear public from the imposition of inefficiency, nor does it prove that the rejected are incapable of rendering good practical service."

"The reason for this is obvious to the educator, but may not be equally clear to the man who looks solely upon the surface of things. The list of ten questions before alluded to may cover each of the subjects of anatomy, physiology, chemistry, materia medica, pathology, therapeutics, bacteriology, metallurgy, histology, oral surgery, mechanical and operative dentistry. It is equally clear that if a man should fail before the State board on anatomy and physiology, materia medica, or chemistry, it would so reduce his average that he would be rejected, although his standing in the other branches, especially the practical, might place him in the front rank in those qualifications that would enable him to render good service to suffering humanity. This does not seem to be considered by the examiners in their final decisions, and the young man is cast out, having spent his three years and earned his diploma in vain. The responsibility of thus wrecking a life may be appreciated by some of the boards of examiners, but it is feared there is a certain degree of satisfaction felt by others that they can

cheerfully say that they are as careful, capable, and conscientious examiners as are the average professors in dental colleges and schools. I base this statement on a personal acquaintance with a large number of dental professors.

I do not claim that our board is infallible, neither will I allow that examinations by dental college professors are infallible, but I contend that our board is a supplement to the colleges, and as it is in harmony with the colleges is an additional safeguard to the public.

Our board never rejected a man who failed "on physiology, materia medica, or chemistry" provided he was well up on the other and more practical branches, but it does reject men who show by their examination papers that they know little or nothing on all of these subjects, even if dental colleges have accepted their money and soft-hearted professors voted them diplomas, thereby informing a trusting public that they are competent to practise dentistry in their (the professors') estimation.

Our board believes that the public should receive as great consideration as a student, and is not in the gloating business over wrecked lives.

thus show their great superiority to the colleges that trained these young men. . . ."

"The questions usually asked bear only a remote relation to the several subjects as practically taught. This could not be avoided when the course of most of these is understood. *Quia compendia* and ancient first editions of Harper's "Principles and Practice" are not exactly the best mines out of which to dig thoughts and modern sciences. It is not to be understood that this is applicable to all members of examining boards. Many of these are known to be cultured men, anxious to do the right thing in the right way. These, however, are handicapped by their lack of knowledge of what a modern dental college education means. They, as a rule, have never held close relation with professional pedagogical work, and therefore are, and have always been, out of touch with that knowledge which can only be received through intimate relations with student life and students' work. The questions given in these re-examinations lack life. They are apt to be general in character, striking, as it were, at the periphery of a subject rather than seeking the innermost dental idea. The untutored candidate invariably seeks a question that when answered means nothing of real value, and which fails to demonstrate the knowledge of the individual, but it gives a certain degree of satisfaction to the examiner, as it magnifies his self-consciousness of power."

The following are the questions asked at our examination in June, 1901. They can be pulled to pieces, and are not above technical criticism. We never ask such questions, our aim being to secure those that they may be easily comprehended by, and not confuse the ordinary candidate.

I have been concerned with a dental school for many years and am familiar with school examinations, and I submit these questions without hesitation, believing that they average in fairness and intelligence with any college questions on the same subjects.

OPERATIVE DENTISTRY.

(June 20, 1901.)

1. State briefly the general instructions you would give a patient in the hygienic care of the teeth.
2. What are the different shades of color in dental decay indicative of?
3. Describe in detail your method of destroying the pulp and your after treatment of the tooth.
4. What causes the discoloration of pulpless teeth? How would you avoid it?
5. State how you would distinguish between a case of pulpitis and acute abscess above.
6. Give treatment of such case.
7. What conditions involve and are less served by combination filling? How do you proceed?
8. Describe your treatment of "pyorrhea" in its incipient and chronic stage.
9. When a fixed tooth is particularly sensitive to heat, what does it indicate?
10. Describe the condition that gold possesses to make it so desirable as a filling material.

CHEMISTRY AND METALLURGY.

(Examination, June, 1900.)

1. Define (a) Cohesion, (b) Adhesion, (c) Polarity, (d) Repulsion.
2. What are the three laws of chemical combination?
3. Where does Nitrogen occur? What are its properties? Why does Nitrogen often produce explosive compounds?
4. Finish the following equation: $\text{CaCO}_3 + \text{H}_2\text{SO}_4 =$. Describe the process represented. What are the properties of the gas thus formed?
5. What is Borax? Where does it occur? What are its properties?
6. What effect on Gold to alloy it with (a) Tin, (b) Lead, (c) Bismuth, (d) Silver?
7. How is Copper Amalgam prepared? What serious objections against its use for fillings in the mouth?
8. How is *elastic* or *spring* gold prepared, and for what purpose is such an alloy used in dental practice?
9. State the advantages and disadvantages of an alloy of Platinum and Gold for filling teeth.
10. What is Purple of Cassius? How is it prepared? Its use in dentistry?

MATERIA MEDICA AND THERAPEUTICS.

(Examination, June, 1900.)

1. What is an Aqua? A Liquor?
A Spiritus? A Tinctura?
An Extractum Fluidum?
Give an example of each.
2. What is a Diaphoretic? A Diuretic? An Antiphlogistic?
A Sialogogue? An Anodyne?
3. What is the action of Acids and Alkalies on the secreting glands?

4. Mention two heart stimulants that act rapidly and give the dose of each.
5. Describe Chloral; physiological action and dose; its effect on the blood; what effect when used hypodermically in the gums?
6. Describe the Therapeutics of salicy-gums.
7. Describe the action of Iodine in the treatment of putrescent exanth and ulcious abscess. Name two substitutes for Iodine.
8. Describe Belladonna; its physiological action; dose of extract and of tincture. Name the official alkaloid. What drug does it antagonize? Of what value as an anodyne application to an inflamed or exposed pulp?
9. Describe Ergot; physiological action; state when and for what purpose it might be used in dental practice. What preparation and dose?
10. Write a prescription for Rhoad powder, containing Antipyrine, Phenacetine, Opium, Sulphur, Elixopt (pale), Caffeine Citrate. One powder to be given every two hours. The dose of Caffeine to be one grain, and of the other drugs two grains each. State when and for what purpose this would be given in dental practice.

PROBLEMS AND EXERCISES.

(June 20, 1895.)

1. Describe India rubber-plate.
2. What is the function of the heart? Liver? Kidney? Pancreas?

3. Describe the formation of the enamel organ?
4. What is the origin of the uric acid in the body; conditions that increase its production?
5. Describe the structure of a salivary gland.
6. What are the organisms that produce pus? What is pus?
7. Name the digestive fluids and state their function.
8. How is nitrous oxide made and prepared for administration?
9. State the general instructions you would give a patient to prepare for the administration of ether.
10. What are the signs of danger in ether narcosis?

PROSTHETIC DENTISTRY.

(*June 20, 1900.*)

1. Mention three materials for artificial plates, giving special conditions for which each is indicated.
2. Write one-half page on diagnosis and prognosis of a mouth for which an artificial denture is called for.
3. *a.* Explain what "suction" is as spoken of in connection with artificial dentures.
b. Give some of the difficulties in the way of obtaining a good suction.
4. Describe (*a*) Hammer swedging.
(*b*) Press swedging.
(*c*) Shot swedging, and comment on each.
5. Give a short description of gold plate, platinized gold and gold solder used in prosthetic dentistry.
6. What is a cast metal plate, and how is it made?
7. What are the principal objections to the soldered gold dentures

formerly so extensively used, and how may these objections be removed?

8. How would you restore the inferior surface and second Molarside for a man with a normal jaw?
9. In flasking a vulcanite case state under what conditions you would have the teeth mould in the half of the flask with the model, and when you would have them come away in the other half.
10. If in swelling a gold plate some of the metal of the die should adhere to the gold or, if a piece of tin or a glissade of mercury should become attached to the plate, what would be the result when the gold is again moulded?

PATHELOGY, SURGERY AND DENTISTRY.

[June 20, 1901.]

1. Mention the varieties of inflammation of the tissues surrounding. Give the appearance of each variety.
2. Give the treatment of contaminated wounds.
3. What are the local and constitutional causes of secondary hemorrhage?
4. Describe the pathological changes in acute inflammation.
5. Describe the changes produced by fixation of the temporomandibular articulation.
6. What are the causes, symptoms and treatment of pericoronitis of the lower jaw?
7. Enumerate the history. When is the operation indicated?
8. What are the different kinds of bacteria? Describe them.

9. Mention the different kinds of tumors of the gums.
10. Why should dental instruments be sterilized? Give your method.

ORTHODONTIA—CROWN AND BRIDGE
WORK.

(June 20, 1900.)

1. *a.* How would you elongate a tooth?
- b.* How would you depress a tooth?
2. *a.* How would you rotate a tooth?
- b.* How hold it in position after rotating?
3. How would you make a crib plate? Give some of its uses.
4. Name and describe (not how made) all the crowns you can.
5. How would you crown a superior cuspid root for a lady, the root being strong and healthy?
6. How would you crown an inferior second bicuspid root for a man, the root being strong and healthy?
7. It being imperative to crown a superior central root, the root having a small hole through its side midway between its apex and the margin of the gum, how would you do it?
8. What is the difference between a removable bridge and a plate with clasps?
9. How would you bridge in the six superior anterior teeth, having the left cuspid right central and lateral roots, all the roots being firm and healthy, *but out of their normal positions?*
10. If you were making bridges having for their abutments the inferior left cuspid and second molar, and superior left cuspid and second molar (both in same mouth), how would you get the articulation?

ANATOMY AND PHYSIOLOGY.

(June 25, 1895.)

1. What blood vessels supply roof of the mouth, where do they emerge, and where do they make their exit?
2. What forms form non-lachrymal canal, and where does it open?
3. What does infra-orbital artery anastomose with?
4. Give course of facial artery and its branches.
5. Give function of buccinator muscle, with its origin and insertion.
6. Looms, describe and give distinguishing features of Frontal and Ulna.
7. Nerves—point of exit from cranium, character of and general distribution of 5th and 6th pairs.
8. Describe the structure (a) of bone; (b) of dentine; (c) of enamel.
9. Describe the varieties of muscular tissue.
10. Describe the ichthyofurans.

"The question of greater importance to the public, were it properly appreciated, would be, Do these re-examinations protect the people? As the boards are at present constituted, the answer must be in the negative. They not only do not protect, but experience has demonstrated that they are a menace to the very people they are supposed to serve."

The experience of one board is that these "re-examinations" are absolutely necessary. How it would be if all professions were like our editor and all schools like his I do not pretend to say, but as the schools "are at present constituted" it is the only way.

We have scores of men come up for examination, holding diplomas from various colleges, who, if their work before us is any bad, do not know the first principles of casting, formation or of gold manipulation; they cannot diagnose the gleamst case of a dead pulp, but still re-examine in the upper jaw (and recommended this) by turning the patient's head upside down so that the Kling-schneid might flow into the canal by gravitation. Yet these men

hold the degree of D.D.S. voted to them by professors in dental colleges.

These are the men our board keeps from practising dentistry in this State by re-examination. In what sense can this be "a menace to the very people they (the boards) are supposed to serve?"

"A quarter of a century has passed since the influence of State boards began to be seriously felt, and this constitutes a sufficient period to measure results. Twenty-five years ago there were a few cases in all large cities where men sought to secure practice by unethical methods, but these were so few, and, while annoying from a professional stand-point, they occasioned no marked deleterious influence. The result now, after this long period of law, is that the "Dental Parlor" is duplicated and reduplicated in every large city, and even in smaller towns where it previously had no existence. It may be said that this has no direct bearing on the laws; that this would have been the result had no laws governing dentistry been placed upon the statute-books. This is possibly true, but the laws have been a complete failure in the suppression of these, even in the one State that fully enforces its law. The graduates, instead of being fewer in number, have been enormously increased until even educators have become anxious as to the final result. To meet this and to make more thorough men, the standard of entrance has been raised in all the colleges of the country. The curriculum has been advanced and the time lengthened until it would seem impossible to go farther in this direction, and yet a still further increase in years is now demanded. For all these changes the boards take to themselves special credit. It is safe to assert that they had nothing to do with any ad-

Our editor has in this paragraph completely demolished, in his own estimation, all State boards. He, at least, has no further use for them.

Colleges will continue to graduate quacks just so long as they will pay their money, behave themselves while in college, and pass the required examination.

The larger number of quacks, however, probably never saw the inside of a college. That the public will be less injured by quacks that can pass a good stiff board examination than by those who cannot is hardly open to question. For this class we cannot provide too many examinations.

If all this "advance" has "come from within," why do the professors of dental colleges come to us and ask what they can do to fit their students to pass our boards? Why do they wish to know wherein their students are deficient when they come before us for re-examination? Our editorial says that no influence on the standard of the colleges comes from "without." The boards are certainly not "within," yet we are asked to advise in the matter of the college standard.

What has caused this "enormously increased" number of graduates that makes "even educators . . . anxious?" Members of examining boards *know* that a large number of men go to the dental colleges for the sole purpose of enabling them to pass State board examinations. This is *beyond question* one great cause of the increase in the num-

vanous. This came from within, and not from without, and would have been found necessary had the boards never been established. This is the status at present. The students are made to suffer, and the dental profession has gained nothing through this so-called supervisory power."

Now if dental education is a good thing and tends to make better and more-competent dentists, the public gains through the witnesses of State boards that witness the college training segments for all the men who are influenced by those trained colleges.

Does our editor believe that this same amount of dental college training is a safeguard or a menace to the public?

In the last line of this paragraph the fact that "the dental profession has gained nothing" is mentioned. In this State the law was not passed for the benefit of the profession, and it is not being administered on that line.

"The fact that the State laws governing dentistry are not enforced to any appreciable extent is patent to every observer. It is possible in some of the States possessing stringent laws, for a man to practice in spite of the boards, and this has frequently been done. The answer the boards make to this is, 'We are not appointed for police work, and fulfil our duty when we have examined the students.' This is true, and the enforcement of the law then devolves on others. The State officials whose duty it is take no interest in it, and will do nothing unless cases are brought directly to their notice, with proper evidence sufficient to secure conviction. The State associations have appointed committees, but they have failed to produce satisfactory results. The duty is disagreeable, and means large expenditures of money and time, and a certain loss of reputation. The result is that the law is not enforced. It would be perfectly easy in the State in which the writer lives for a man to practice dentistry without even a college training, and some have boldly declared they would practice in spite of the decision of the board. This is unquestionably a bad state of things,

In Massachusetts there have been one hundred and forty-one prosecutions. With three or four exceptions those prosecuted have each paid fifty dollars, or upward, fine.

A very large number who were practicing illegally have stopped on being notified that they would be prosecuted if they continued to violate the law.

I write our editor and all other men to assist in the enforcement of good dental laws in the spirit and for the purposes for which they were enacted.

There are in this State laws against theft, arson, embezzlement, pollution of water supplies, bigamy, and sundry other evils, and every day there are being broken, yet our good citizens do not say, "Better to live than to withstand violation."

but it is not only the case, but there seems no prospect of any improvement. Better no law than its constant violation. . . .”

“The future of these boards is a problem that will require the combined wisdom of all thinking minds. It is too late to expect these to be dispensed with. The laws will remain, and we must continue to have these bodies to deal with for many years to come. The question that interests us now is, Can there be any change made in the selection of those who will constitute these boards in the future?”

In this State there are two dental schools. The relations of the board to these schools is most gratifying, each being respected by the other, and all working in harmony.

It sometimes happens that the board turns down a man that one of the schools has graduated. An investigation almost always shows that the man was just on the border-line, and it was a question for discussion whether he should receive a degree or not. So, also, if we pass a man to whom the school has refused its diploma, we find that he went in by the smallest margin, thus showing that the estimate of the schools and that of the board were almost exactly on the same line.

There is one notable instance where a diploma was granted by one of the schools and a certificate of registration by the board to a man who was very deficient in certain qualifications usually required but waived in this case on account of the almost universal belief of professors and examiners that he was an eminently *safe* man.

What is needed, as it seems to me, is that the same harmony of purpose and mutual regard that exists between schools and board in this State shall be brought about between all schools and all boards in all of the States.

This can be done only when all good men and especially such strong men, of which our editor is the type, shall drop prejudice and not close their eyes to existing good, but, with true loyalty to the people, to the profession, and to the student, work in harmony for the perpetuation of that which is good in present laws and the pruning out of the bad

I am acquainted with many dental educators, and I know that they are trying to do their best. I am acquainted, also, with dental examinations in several of the States, and from their standing as professional men and as gentlemen I know that they are just as anxious, faithful and honest in the discharge of their duties as are the professors.

Let us foster in every way the better understanding that is gradually growing between the National Association of Dental Faculties and the National Association of Dental Examining Boards.

Does any one think that without State boards the number of those calling themselves dentists would not be largely increased? Six months in a dentist's laboratory would be considered by many as ample preparation for opening an office and peddling the title of Dr. to their names. To this class State boards prove a wholesome snuffing-block, and I am sure the people of this State would not consent to have the law repealed.

DWIGHT M. CLAPP, D.M.D.

130 COMMONWEALTH AVENUE, BOSTON, MASS.

Foreign Correspondence.

REPLY TO DR. HOPKINS.

TO THE EDITOR.

SIR,—In the October number of your esteemed journal, page 708, will be found a statement by Dr. Hopkins to the effect that he has succeeded in producing artificial caries by a pure culture of a mouth-bacterium, and believes it to be the first authentic instance in which this has been accomplished. I have already repeatedly called attention to the fact that artificial caries was produced,

by means of a pure culture of a bacterium isolated from carious dentine, as early as 1884, and that the experiments were described in the *Independent Practitioner* for 1884, page 113 *et seq.*

Yours very sincerely,

W. D. MILLER.

VICTORIASTR. 30, BERLIN, October 19, 1900.

Notes and Comments.¹

AMALGAM ALLOYS.—In his characteristic style, Dr. J. Foster Flagg has given the profession another one of his thoughtful essays on the subject of amalgams.

“Truly it would seem,” the doctor says, “as though a dental P. T. Barnum might have arisen in our midst, and that Joyce Heth, ‘The Only Perfect’ nurse of the ‘Immortal Father of his Country,’ together with ‘The Woolly Horse’ and ‘The Happy Family,’ were making for dentistry its ‘Greatest Show on Earth;’ and this has been going on for the past three years. . . . I have taught for many years that, as the profits to the supply-houses upon amalgam alloys were incredibly enormous, and that as dentists were paying exorbitant prices for materials which should be afforded them at reasonable rates, it ought to be that the charges for alloys should be no more than *half* that which they were.”

A REPLY TO “AN UNJUST CRITICISM.”—In reference to our recent note in this department upon “An Unjust Criticism,” we are pleased to give the following from Dr. E. P. Beadles, of Danville, Va.:

“In a paper,” the doctor says, “read in Baltimore, I used the words, ‘Dentists are the greatest braggarts on earth,’ etc. I do not think this can be construed to mean that *all* dentists are brag-

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

garts; at any rate, I did not mean that the sentence should be so understood. I assert, however, that as a class there are very many braggarts among us, and that this thing works greatly to our hurt in many ways. When said, I was giving this as one reason why there is such an influx of young men into the dental profession. From our own statements, they regard us as great money-makers. I have it from good authority that not one-half of the dentists of the United States are able to pay their debts. I have heard otherwise excellent men continually bragging of how busy they are and how much they make."

Current News.

BOARD OF EXAMINERS OF PENNSYLVANIA.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, December 17 to 20, 1900.

Application for examination must be made to Hon. James W. Latta, Secretary of the Dental Council, Harrisburg, Pa.

G. W. KLUMP,

Secretary.

WILLIAMSPORT, PA.

THE TROUBLE IN THE NEW JERSEY STATE BOARD

[VOLUMINOUS matter has been received relating to the controversy between certain members of the State Examining Board of New Jersey and Dr. Charles A. Meeker, another member. It would require too much space to reproduce the entire subject, and, therefore, an abstract of the charges against Dr. Meeker is appended, together with the closing of Dr. Meeker in his full answer to the charges sent to the governor of the State of New Jersey.—Ed.]

CHARGES.

1. Dr. Meeker is charged with being unfit for the position he occupied.

2. "In almost every case (Dr. Meeker) gave a candidate a passing vote."

3. "The board became convinced that Dr. Meeker was not voting according to the papers written by the applicants under examination. . . . Proof was not secured till at the July, 1899, meeting of the board."

4. "Dr. Meeker has seriously hampered the work of the board, not only by his failure to attend meetings, but in his neglect in preparing questions for the examination."

The foregoing, in full was sent to the governor, signed by Geo. E. Adams, D.D.S., President; F. C. Barlow, D.D.S., E. M. Beesley, D.D.S., E. Carlton Brown, D.D.S., Secretary.

The governor thereupon sent the following notice to Dr. Charles A. Meeker:

"STATE OF NEW JERSEY, EXECUTIVE DEPARTMENT,
"October 5, 1900.

"DEAR SIR,—Charges of incompetency and inefficiency as a member of the State Board of Registration and Examination in Dentistry have been laid before me. A copy thereof is hereto annexed.

"Before disposing of the same it is but fair that you should be given an opportunity to reply thereto, and I have accordingly fixed the hour of ten A.M., on the 13th day of October, 1900, at my office in Elizabeth, as the time and place when I will proceed to consider the same, and hear you if you so desire.

"Yours truly,

"FOSTER M. VOORHEES.

"CHARLES A. MEEKER, D.D.S."

In reply to this request Dr. Meeker sent a very full answer to the charges, an abstract of which is herewith appended.

"The first specific charge is that in almost every case I gave a passing vote. In reply to this, I assert that my vote as to the merits of the papers presented by candidates has in all cases represented my honest conviction as to the merits of these papers.

"The charge that I have hampered the work of the board, not only by my failure to attend meetings, but by my neglect in preparing questions for the examination is absolutely false.

"The charge that I have invariably given candidates a passing vote would mean that I have always given candidates as many as

twenty votes. The true facts may be ascertained by an examination of the records."

Dr. Mecker then closes as follows:

"I desire to say, generally, that for a number of years I served in this Association with the gentlemen who now prefer charges against me with perfect accord and harmony, and during all that time our Commission was a member of the National Association, and it was conceded that we were exerting a wide influence through that body for the elevation of the standards of professional education throughout the country. Dr. G. Carlston Brown was one of the most arduous workers in the National Association, and the rules of that body, which he afterwards insisted should operate to make us resign our membership, were formulated largely under his influence and direction. Very suddenly and without apparent reason my associates have exhibited personal hostility to me, and they now allege 'incompetence.' It is to be noted that this incompetence is a matter of recent discovery, and the specifications contained in the charges are pitifully weak and frivolous. The majority of the members of the board have attempted to force me to resign my membership in it, and were bitterly chagrined at my re-election in 1899. I have been at a loss to understand why this change of feeling towards me, and but one explanation has occurred to me. Some years ago, when serving on the auditing committee, I expressed surprise that no vouchers were presented for the sums expended. I did this purely as a matter of the proper conduct of the business of the board, but it was resented as a personal affront, and I was not again appointed on the auditing committee, and since then I have without difficulty discovered the hostility towards me which has been exhibited by my associates.

"I have been for several years the Secretary and Treasurer of the National Association, and have been for twenty-five years the Secretary of the State Dental Society, and have devoted a large part of my time and have incurred considerable expense in advancing the interest of the profession in this State and throughout the country. I have been re-elected to office by the National Association, and also by the State society, and if I am incompetent for membership of the State Commission, such incompetency must have existed during all these years, and must be proved by something more than loosely worded charges and malicious criticism.

"As an example of the petty annoyances to which I have been

subjected by my associates, I will state that on May 3, 1900, I was notified to attend a meeting of the State board for Saturday, May 5, at eight P.M. It was known then to my associates in the board that a banquet tendered by the president to the officers of our local society had been set for that date, and that I had in a measure assumed the management of the arrangements. This notice was sent to me by registered mail, the only instance of the registration of a notice of meeting. It happened that the banquet of the president was postponed to Saturday, May 12, and this becoming known I was promptly notified that the meeting of the Commission had been postponed to May 12, and this explains my absence from one meeting. It also illustrates the purpose of the conduct of my associates in their treatment of me.

"Again, a meeting of the State board was called for July 28, the day on which I was to sail for Europe as a delegate to the International Congress of Dentists, having been appointed by the State society and also by the National Association as their representative. After my departure for Europe, a change was made in the subjects of the various examiners. An examination of these changes shows that two of the examiners kept their old subjects; a third taking Dr. Beesley's, while mine was taken from me and given to Dr. Osmun. This is an unusual proceeding, the custom in our board and other examining boards being to continue the subjects of each examiner so long as he remains an examiner, with a view to securing the highest service from the board.

"Much more might be added in explanation of the animus of these charges which your Excellency is now forced to consider, and I am grateful to you for the opportunity of presenting my answer thereto; but I respectfully submit that in no single particular have I failed to perform my official duty as a member of the examining board, and that it must be clear that personal hostility and not devotion to the interests of a great profession lies at the bottom of the action of my associates. They probably believe that even though these charges shall be dismissed by your Excellency, they will nevertheless have succeeded in doing me a professional injury, and it is not unlikely that they will be satisfied with this as the solitary result of their action in presenting these charges.

"All of which is respectfully submitted.

"CHAS. A. MEEKER."

Dismissed by the governor and exonerated.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY—RESOLUTIONS OF CONFIDENCE IN DR. MECKER.

WHEREAS, Charges of incompetency and inefficiency have been lodged with the governor of this State against a member of the Board of Registration and Examination in Dentistry; and

WHEREAS, Such member of the Board of Registration and Examination in Dentistry is also a member of this society in good standing and of good repute; and

WHEREAS, Such member having practiced dentistry in this State for more than thirty years, and during that time been one of the most progressive and active members of the profession,—having held all the offices of honor that could be bestowed by both the State and Central societies,—who before the operation of the present dental law was for years the State prosecutor of violators of the dental law, the duties of which office he discharged with marked ability and discretion; who has been honored with office by the National Association of Dental Examiners, and who has been regarded for many years by the profession in this State and practically every State in the United States, and in many parts of South America and Europe, as a professional man of ability and attainments, one whose professional course was worthy of emulation by the younger members of the profession; one who by his fidelity to trusts imposed upon him has done more to elevate and advance the interests and good name, as well as fame, of the New Jersey State Dental Society and the Central Dental Association of Northern New Jersey than any other member of either of the societies, and one who has never before been charged with dereliction or neglect in the discharge of official duties, it seems right and proper that we, the members of the Central Dental Association of Northern New Jersey, in regular meeting assembled on this fifteenth day of October, 1900, in the city of Newark, N. J., should give public expression of our feelings and sentiments concerning the charges that have been made against our fellow member and treasurer, Dr. Charles A. Meeker, of Newark; therefore be it

Resolved, That we, the members of the Central Dental Association of Northern New Jersey, express to Dr. Charles A. Meeker, a member of this society, our confidence in his professional ability,

his fidelity to duty, and his untiring devotion to the cause of dental education and advancement; and be it

Resolved, That a copy of these resolutions be forwarded to Hon. Foster M. Voorhees, governor of this State, and also spread upon the minutes of this society.

AMERICAN DENTAL SOCIETY OF EUROPE.

At the twenty-seventh annual meeting of the American Dental Society of Europe, held in Paris upon August 7, 1900, the following-named officers were elected for the ensuing year: President, Dr. W. Mitchell, London; Vice-President, Dr. S. S. Macfarlane, Frankfort-on-Main; Honorary Treasurer, Dr. L. J. Mitchell, London; Honorary Secretary, Dr. W. E. Royce, Tunbridge Wells.

Executive Committee.—Dr. L. J. Mitchell, Dr. E. Lawley-York, Dr. J. H. Spaulding, Dr. L. C. Bryan, Dr. W. S. Davenport, Dr. W. L. Croll. Ex-officio members, Dr. W. Mitchell, Chairman; Dr. W. E. Royce, Honorary Secretary.

Membership Committee.—Dr. C. J. Monk, Dr. G. Cunningham, Dr. W. L. Croll. Ex-officio members, Dr. S. S. Macfarlane, Chairman; Dr. W. E. Royce, Honorary Secretary.

WALDO E. ROYCE,
Honorary Secretary.

INSTITUTE OF DENTAL PEDAGOGICS.

THE eighth annual meeting of the Institute of Dental Pedagogics will convene on Thursday, December 27, 1900, at ten o'clock A.M., at the Maxwell House, Nashville, Tenn., and will hold sessions on December 27, 28, and 29.

HENRY W. MORGAN,
DAVID M. CATTELL,
WALTER E. WILLMOTT,
Executive Committee.

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